

UNIVERSITY  
OF MICHIGAN

JAN 30 1951

DENTISTRY  
LIBRARY

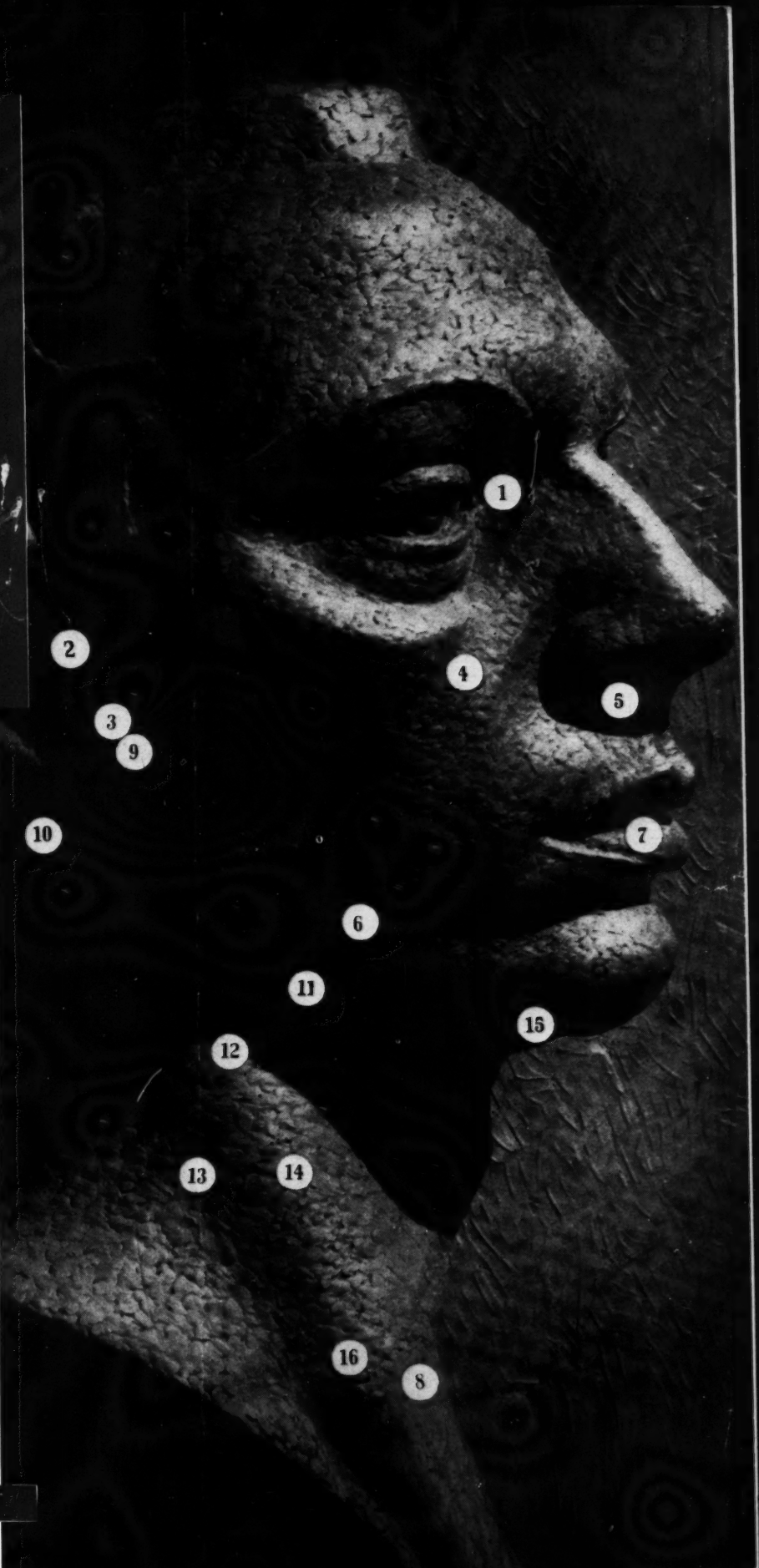
# Dental Digest

REMOVED OR  
January 1951

## IN THIS ISSUE

al Dynamics .....	10
halation During Dental Extraction .....	16
eurolene for Inhalation Anesthesia and Analgesia ..	17
he Correction of Traumatic Occlusion by Articulator Analysis .....	20
he Rest Position of the Mandible .....	23
inciples of Partial Denture Design .....	24
inical and Laboratory Suggestions .....	30
he Editor's Page .....	32
edicine and the Biologic Sciences .....	33
gistration of the Denture Space .....	36
ntra-Angles .....	40

(Explanation and cover picture  
on page 16)



NOTE: MEASUREMENTS FOR CENTRALS ARE GIVEN

IN MILLIMETERS • LENGTHS NOTED ARE EXCLUSIVE OF COLLARS

these

12

new upper molds

FIVE-

have been added to the

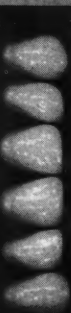
PHASE co-ordinate size system...

M40/C



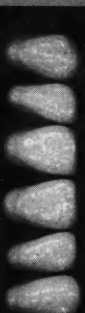
CENTRALS: WIDTH 7.4 • LENGTH 9.4

S40/C



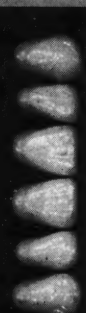
CENTRALS: WIDTH 7.4 • LENGTH 8.4

M40/F



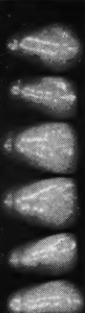
CENTRALS: WIDTH 7.4 • LENGTH 9.4

S40/F



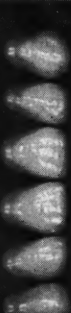
CENTRALS: WIDTH 7.4 • LENGTH 8.4

M43/C



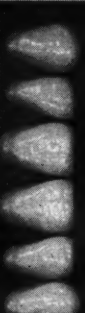
CENTRALS: WIDTH 7.9 • LENGTH 10.0

S43/C



CENTRALS: WIDTH 7.9 • LENGTH 9.0

M43/F



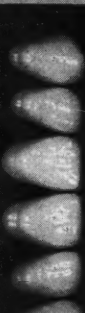
CENTRALS: WIDTH 7.9 • LENGTH 10.0

S43/F



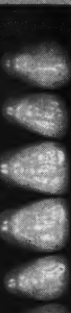
CENTRALS: WIDTH 7.9 • LENGTH 9.0

M46/C



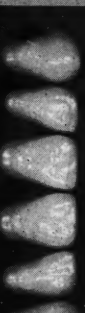
CENTRALS: WIDTH 8.5 • LENGTH 10.3

S46/C



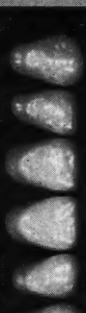
CENTRALS: WIDTH 8.5 • LENGTH 9.6

M46/F



CENTRALS: WIDTH 8.5 • LENGTH 10.3

S46/F



CENTRALS: WIDTH 8.5 • LENGTH 9.6

These new anterior molds are an integral part of the Five-Phase Co-ordinate Size System. This fine addition will broaden your scope of selection considerably, helping you further to personalize your dentures by virtue of the exclusive features incorporated in Five-Phase Anterior.

Specify Five-Phase Anterior for your next denture—to appreciate fully their natural beauty and "living" esthetics—to see how considerably they can contribute toward the creation of more lifelike appearance for your dentures.

Complete stocks of Five-Phase Anterior are available in all Veri-chrome Natural Tooth Colors—at all Universal Dealers.

FIVE - PHASE

A N T E R I O R S

Veri-chrome

COLORS OF CENTRALS



Dental  
Wahwa

Vol. 57, No. 1

# Dental Digest

Registered in U.S. Patent Office

**JANUARY 1951**

## About Our

## CONTRIBUTORS

THOMAS H. FORDE, D.D.S. (University of California, College of Dentistry, 1924) also studied engineering at the University of Utah. Doctor Forde is a member of the International Academy of Oral Dynamics and in the current issue DIGEST presents the first installment of a four-part article, ORAL DYNAMICS. Doctor Edward J. Koltisko did the artwork which accompanies Doctor Forde's article.

LOUIS WILLINGER, D.D.S. (New York University, College of Dentistry, 1922) was formerly Chief of Oral Surgery, Lebanon Hospital Dental Clinic and is Instructor in General Anesthesia for the First District Dental Society and Director of the General Anesthesia Study Club. In his article, NEUROLENE FOR INHALATION ANESTHESIA AND ANALGESIA, Doctor Willinger gives specific directions for the use of a synergetic agent in combination with nitrous oxide-oxygen as a general anesthetic for the ambulatory patient.

L. C. HOLTZENDORFF, B.A. (Emory University, 1928), D.D.S. (Emory University, 1934) is known to DIGEST readers for his previous articles on technical subjects. In THE CORRECTION OF TRAUMATIC OCCLUSION BY ARTICULATOR ANALYSIS, Doctor Holtzendorff describes the procedure for correcting traumatic occlusion that he has found to be most successful.

HENRY A. COLLETT, D.D.S. Commander (DC) USN, (Temple University, School of Dentistry, 1939) specializes in prosthodontics and has published a number of articles on this and related subjects. Commander Collett publishes for the first time in DENTAL DIGEST this month. His article is PRINCIPLES OF PARTIAL DENTURE DESIGN.

Oral Dynamics (Part One) <i>Thomas H. Forde, D.D.S.</i> .....	10
Inhalation During Dental Extraction (An Abstract) .....	16
Neurolene for Inhalation Anesthesia and Analgesia <i>Louis Willinger, D.D.S.</i> .....	17
The Correction of Traumatic Occlusion by Articulator Analysis <i>L. C. Holtzendorff, D.D.S.</i> .....	20
The Rest Position of the Mandible (An Abstract) .....	23
Principles of Partial Denture Design <i>Henry A. Collett, D.D.S., Commander (DC) USN</i> .....	24
Clinical and Laboratory Suggestions .....	30
1. Surface Anesthesia with an Atomizer. 2. Treatment of Sensitive Cementum. 3. A Matrix Retainer for Anterior Acrylic Restorations. 4. Stabilizing Free Saddles in Partial Dentures. 5. Locating a Retained Root in an Edentulous Arch. 6. A Combined Marking Paste and Surface Anesthetic.	
The Editor's Page .....	32
Contra-Angles .....	40
Medicine and the Biologic Sciences .....	33
Registration of the Denture Space (An Abstract) <i>Robert R. Gillis, D.D.S.</i> .....	36

**EDWARD J. RYAN, B.S., D.D.S., Editor**

**WANDA T. PICKARD, B.A., Assistant Editor**

708 Church Street, Evanston, Illinois

Copyright, 1951, by Dental Digest, Inc. See page 4 for subscription data, etc.  
The magazine is mailed on the fifteenth of the month of issue.

## ORAL DYNAMICS (Part One)

THOMAS H. FORDE, D.D.S., Washington, D.C.

### DIGEST

*Oral dynamics is the study of the force pattern of the mouth based on physical, chemical, and biologic laws. A careful study of oral dynamics discloses the principal factors responsible for the premature loss of teeth.*

*Operative procedures in dentistry and thinking in general have crystallized into a pattern which calls for balancing and equalizing the occlusion in centric and fundamental positions by selective grinding. (1) Harmonious intercuspitation, (2) uniformity of occlusal impact, and (3) interference from premature contact are the goals in view.*

*Investigators, however, have*

*pointed out two important factors: (A) the ability of teeth to absorb stresses most efficiently in their own long axis, and (B) the responsibility of the dentist to provide adequate occlusal wear to compensate for the lack of abrasives in the diet which formerly served to decrease cuspal height.*

*The methods advocated in this article, of which this is the first installment in a series of four, require a complete change in the force pattern of the mouth to obtain stability and a complete relief from fatigue. Absorption of stresses in the oral cavity is the basis upon which this phase of preventive dentistry will be discussed.*

### Dentition in Primitive Man

A sound approach to the subject of oral dynamics necessitates a review of the work of Nature to discover how our ancestors retained their teeth throughout the normal life cycle. Our museums contain Nature's library of human skulls, relics collected from all climates and continents and representing many different civilizations. Examination of the dentition of these skulls reveals one common property, without exception: *natural bite correction*.

*The Influence of Uncooked Food*—Without doubt, the preparation of food largely influenced the human dentition. In the skulls of people who lived prior to the cooking period, the teeth are stronger, the general frame-

work of the bone structure is more massive, and it is reasonable to assume that the muscles were stronger in proportion to the massive jaws. The introduction of cooking produced foods that required less effort to chew, resulting in dental weaknesses that have become progressive through the ages.

*Effects of Sanitation*—The trend toward sanitation brought about removal of the grit, sand, and abrasive substances commonly found in plain dirt. As man accepted the new order of sanitation, he unwittingly deprived himself of the salutary influences of abrasives in his daily diet; for these abrasives had served for millions of years to modify the cuspal planes and remove the sharp interlocking effect of cusps.

*Shortening Process*—The first thing to note in the study of ancient skulls is the shortening of the crowns of the teeth through wear. This shortening process was a deliberate act on the part of Nature to control the density of bone supporting the teeth.

*The Results of Abrasion*—The act of abrasion achieved two distinct results: (1) the removal of all interlocking cusps to give full freedom to the jaws in the act of mastication; and (2) equally important, the shortening of the working arm of the tooth. The latter effect was a natural observance of the elementary law of the lever, which insists that the working arm must not be greater than the supporting arm, or, as exemplified in dentistry, the crown part of the tooth must never be subject to strains too great for the root sections to support.

*Reduction of Strain*—It is obvious that reduction in the cuspal height of the crown of the tooth automatically reduced strain upon the roots and the surrounding bone. The study of oral dynamics lays particular emphasis on the law of the lever in an attempt to duplicate in the civilized mouth the natural bite correction provided in ages past.

*Definite Arch Continuity*—The next thing noted in the study of primitive skulls is the definite arch continuity in the dentition. *There are no missing teeth*. Herein lies another basic physical law which enters significantly into oral dynamics. By virtue of the shape of the arch itself, this phenomenon provides the greatest protective value to the teeth.

Nature preserved this arch through the ages and recognized the importance of continuity. For just as the re-

removal or deterioration of any segment of the fundamental arch weakens the entire structure and threatens its collapse, so the loss or decay of a single tooth endangers the whole dental structure. Reference to study models of adults of the present day demonstrates the deformities that can result from missing segments, or teeth.

**Correction of Occlusion Through Selective Grinding**—For many years the dental profession has manifested great interest in the effects of occlusal loads upon the supporting structures of the teeth. Operative procedures and fundamental thinking in general have crystallized into a pattern which calls for balancing and equilibrating the occlusion in centric and fundamental positions by selective grinding.

**Correction of Occlusal Topography Neglected**—Harmonious intercuspidation and uniformity of occlusal impact are sought and interference from premature contact is corrected. This amount of correction through grinding is both meritorious and courageous on the part of the dental profession, but is not sufficiently broad in its scope, for it does not enter into the correction of occlusal topography.

**Important Factors in Traumatic Occlusion**—Under this plan of treatment recognition is given to the findings of investigators who point out two highly important factors in traumatic occlusion: (1) The ability of teeth to absorb stresses most efficiently in their own long axes, and (2) the responsibility of the dentist to provide adequate occlusal wear to compensate for the lack of abrasives in the diet which formerly served to decrease cuspal height. So the cusps of the teeth remain unchanged and the functional characteristics of the occlusal topography are permitted to continue until the teeth are lost.

**Change in the Force Pattern of the Mouth Required**—For stability and complete relief from fatigue, the methods advocated in the present study require a complete change in the force pattern of the mouth.

**Timely Diagnosis and Proper Mechanical Treatment**—It is assumed

that if the mechanical forces of mastication are properly directed in the mouth of a normal person, the supporting structures will accept the load placed upon them with the same physiologic response as any other body tissue. Timely diagnosis and proper mechanical treatment can avert the breakdown of supporting structures in all cases except those involving systemic factors.

**Breakdown From Systemic Causes Rare**—Such cases are comparatively rare, for the typical present-day mouth indicates breakdown which is not attributable to systemic disorders. The following statement, corroborated by ample evidence, is given special emphasis and amplification:

*Healthy mouths break down through conditions of fatigue and improper function of the masticating apparatus where no contributory systemic factors are present.*

### The Cusps and the Inclined Planes

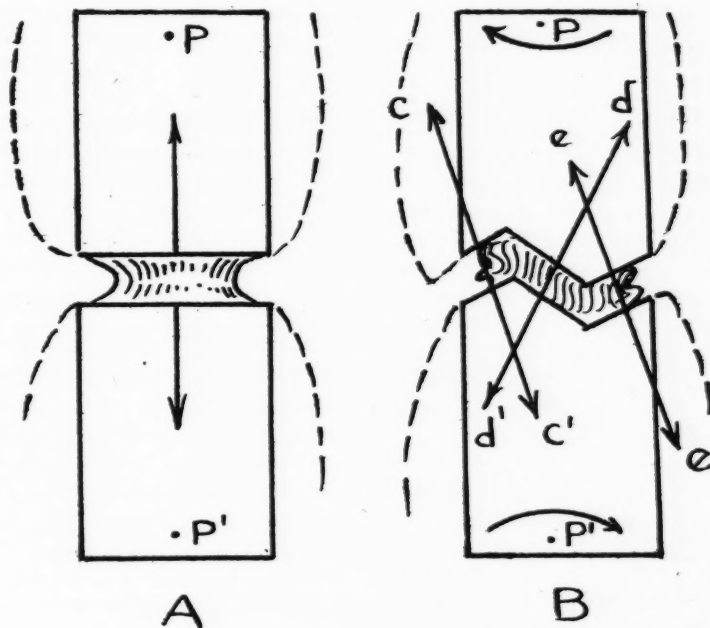
The cuspal topography of the posterior teeth serves a vital function and it will be demonstrated that by virtue

of shape alone their topography is functional as long as it remains.

The first function is to aid in the eruption of the teeth by piercing the mucosa and permitting the teeth to come into functioning position. The inclined planes are responsible for guiding each tooth into proper position in relation to its opposing member.

Through this topography, the dental arch is formed by two primary forces: (1) The tongue, which is the main force in shaping the inside of the arch, and (2) the action of intercuspal stimulation which, through the process of expansion, is responsible for the final form of the arch.

**Diagram 1**—The operation of simple inclined planes is shown. Although mechanical in character, they are absolutely analogous to the mechanical operation of human teeth. Inclined planes, when activated by force, will manifest their deflecting functions. Whether they are cut in steel or developed in the structure of human teeth, these inclined planes are subject to the same irrefutable abstract laws and will deflect or absorb an applied force according to





their angularity. In other words, an impact against a plane surface is absorbed at a right angle to the point of impact.

*Diagram 1, Part A*—The occlusion of primitive teeth is represented.

1. The upper part is a fixed block with a flat surface and a lower moving member with a flat surface.

2. In each case there is a pivoting center (P and P') which permits rotation only under force and shows considerable resistance to any change.

3. It is obvious (1) that the mechanical pounding of the lower part would be absorbed in the direction of the arrows marked on the drawing, and (2) that such pounding would produce no tendency for either member to rotate or to change from its axial alinement. The blows are absorbed in the vertical position on the part of both members, and neither member would have cause to show fatigue or to change in its related position.

*Diagram 1, Part B*—1. The same angularity is shown as that found in the cross section of adult human teeth of the present civilization. The inclined planes control the direction in which the impact is to be absorbed and continuous pounding by the lower member would force the upper block to rotate toward the buccal aspect.

2. The arrows, C and E, on the upper fixed block constitute a majority in the force pattern. Of necessity, the block rotates the lower tooth or moving part which is represented as the lower part of the diagram.

3. The lower tooth would receive the absorption of the impact in the direction of C' and E'.

4. These majority forces would tend to rotate the tooth toward the lingual aspect of the mouth as indicated by the curved arrow.

*Transfer of Force*—The transfer of force is accomplished through any resistive mass placed between the teeth. The act of mastication permits this transfer, and the total amount of muscular pressure exerted during the course of a meal must be absorbed through the inclined planes according to their angularity. This will deter-

mine the direction in which the forces will be absorbed.

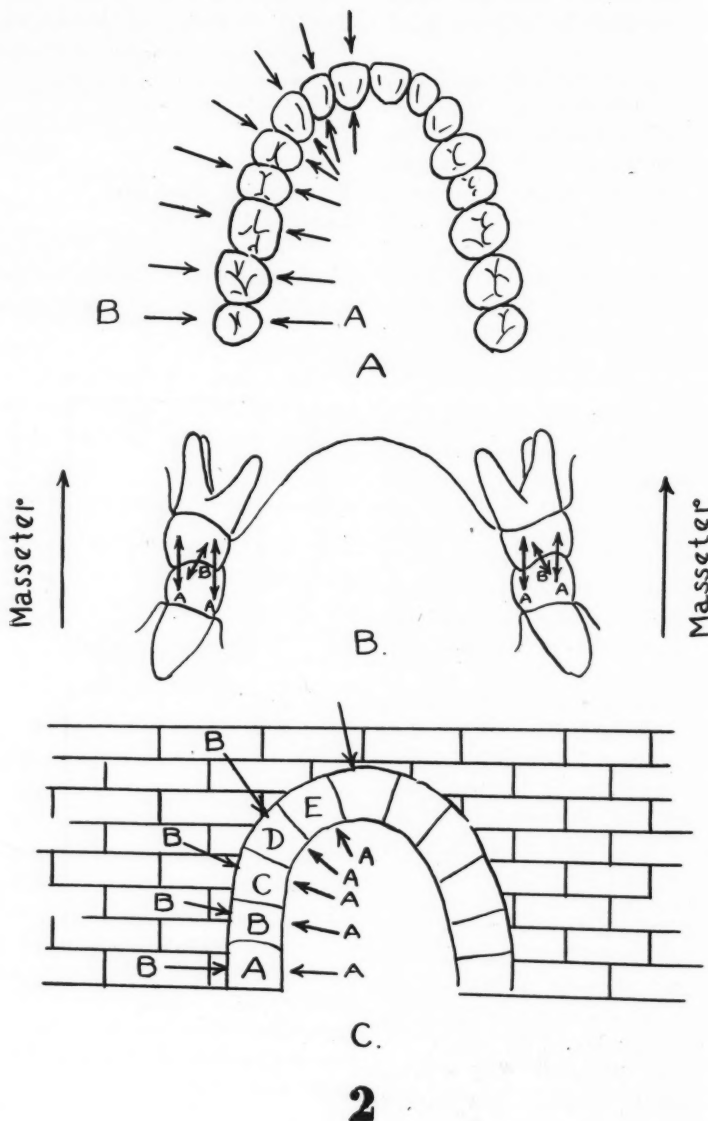
*Control of Inclined Planes*—The inclined planes (D and D') represent the most valuable mechanical features of the human teeth. It is through the control of these planes that the dentist can undertake the greatest steps possible today in preventive dentistry.

*Diagram 2*—This diagram is divided into three parts: 1. The upper part (A) represents an occlusal view of the upper teeth in the human arch. 2. The central part of the diagram (B) represents a cross section through the molar region of adult teeth. 3. The lower part of the dia-

gram (C) represents a simple fundamental arch, or the elementary arch.

*Phenomenon of the Elementary Arch*—The purpose of Diagram 2 is (1) to compare the human arch with the elementary arch, and (2) to show that the phenomenon of the elementary arch exists in the human arch and is subject to the same strength and weakness.

*Mechanical Significance*: The phenomenon of the elementary arch is based upon the fact that all pressures against the segments are exerted on their external surface. The mechanical significance of the phenomenon is that segments placed in the shape of an arch will become stronger as pres-



sure is exerted on their external surfaces.

**Example:** We know that if blocks were set together as shown in the diagram, using no cement, the weight of subsequent masonry placed upon these segments would tend to bond them together more closely and the strength of the arch would increase as long as the weight did not crush or injure any segment.

**Continuity of Function:** The phenomenon of the elementary arch operates as long as the arch enjoys continuity and all pressures are exerted upon the external surface of the arch. It ceases to operate when continuity is destroyed (1) by the displacement or removal of any segment, or (2) when an internal pressure (marked A on the diagram) exceeds the external pressure.

**Cuspal Topography Modified by Nature**—The human dentition presents an apparent mechanical defect in that the lower arch strikes within the upper arch which might lead to the conclusion that the design of Nature was unsound. But Nature has never been proved wrong by the immature mind of man. Her deliberate intent is revealed in the expansion of the upper arch which automatically controls the expansion of the lower arch. However, Nature changed the application of force by modifying the cuspal topography, and that is exactly what the author is trying to demonstrate through this comparison.

**Diagram 2, Part B**—A cross section through the molar region of the posterior teeth is shown. (The reader must think of this action as involving a morsel of food and not as taking place in the empty mouth).

**Directional Pattern of Forces**—The forces marked A on the elementary arch are also marked A in the cross-section diagram. Note that these two arrows are absorbed in a buccal direction against the compensating bone, covering the buccal roots. The reverse end of the arrow, on the lower end of the molar, shows the absorption toward the lingual. The abuse of the phenomenon enters as the force is exerted against the upper tooth, through impact. This is exactly the same force that would de-

stroy the elementary arch in the lower diagram. This, unquestionably, is the expanding force Nature intended it to be. However, its usefulness is confined to the developmental period of the arches and if it is allowed to continue after the arches are formed it becomes highly destructive.

#### *Perpetuation of the Phenomenon*

—The arrow, marked B, is a force against the lingual plane of the upper teeth and the buccal-lingual plane of the lower teeth. This is the favorable force both for the teeth and for the upper arch. It is a condensing force and is comparable to the arrows, marked B, on the elementary diagram.

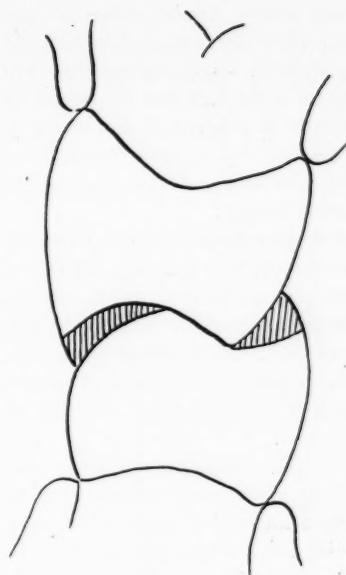
The force upon these planes tends to the following results: (1) to condense the arch, (2) tighten the contacts, (3) relieve fatigue, and (4) to stabilize the arches against any movement, drifting, or other changes. It is the primary force that perpetuates the phenomenon and precludes premature losses through pyorrhea.

#### **Continuity**

Maintaining arch continuity is mandatory at all times. For example, if segment E in the elementary arch is removed, the entire phenomenon is destroyed and the arch can no longer resist the external pressure.

**Signs of Deterioration**—Migrating and loosening of the other segments will be the first signs of deterioration. A unit in the human dentition must be compared to a segment in the elementary arch. A missing segment must be replaced immediately for the purpose of preserving the protective power contained in the phenomenon of the fundamental arch, a purpose far more important than masticating efficiency alone.

**The Antiexpansion Force**—The pressures exerted against the lower posterior teeth would seem to be contrary to the phenomenon because they are applied from the inside. As a matter of fact, the application of force from the inside of an arch is directly contrary and damaging to the phenomenon if this force is greater than the external forces. Fortunately, this is not true in the lower arch



**3**

because the power arms, or major muscles of mastication, which are attached to the external part of the arch operate as an antiexpansion force.

**The Tendency to Condense in Function**—All muscles of mastication function with a tendency to condense, and in many instances, overcondense the lower arch so that the force applied in the direction of B, as marked on the diagram, is a healthy stimulating force, offset by the power of the masseters, indicated in parallel arrows marked "masseter" on the diagram.

**Diagram 3**—This diagram represents a cross section through the molar region of the human dentition. It is intended to show the method used in grinding. The shaded areas represent the amount of tooth structure that is removed.

#### **Spot Grinding**

The primary cause of the premature loss of human teeth can be expressed in the following equation:

M.E. > B.S. (Mechanical Efficiency becomes greater than the Biologic Structures can endure).

**Degree of Violation is Progressive**—It is assumed in this preventive approach that every civilized human

being above fifteen years of age enters into this mechanical-biologic violation to some degree. Most important is the fact that the degree of violation is progressive and increases in geometric proportion as the bone cells give way under a condition of chronic fatigue.

**Palliative Results of Spot Grinding Limited**—1. Spot grinding, which has been the accepted dental approach, actually increases mechanical efficiency to the point of extreme overload. This increases the condition of fatigue which in turn increases the rate of bone loss.

2. Spot grinding is frequently misleading in palliative results. It does remove interfering cusps which may render some temporary relief.

3. Unless the equation itself is altered, spot grinding will only accelerate the rate of destruction and the inevitable exfoliation of the teeth will doubtless occur earlier than would have been the case with the normal pattern of force.

### **Corresponding Force-Effects upon the Lower Teeth**

1. Referring to the situation where one arch strikes within another arch, the end result would be the expansion of the upper arch with a tendency for the lower arch to follow the reverse pattern. Over-condensing of the lower arch would create a series of conditions which, unless corrected, would cause premature loss of the teeth.

2. Dentistry has accepted the theory that impacted third molars cause a crowded condition of the lower anterior teeth. It is the intention herein to disprove this theory. There are many valid reasons for the removal of impacted lower third molars without giving a reason that is not necessarily true.

3. The impact received on the lower teeth is the exact opposite to that delivered to the upper teeth. The absorption of this impact must be in the direction in which the inclined planes direct the force.

4. As shown in Diagrams 1 and 2, the major force is delivered to the lower tooth in a manner which will cause the tooth to develop lingually

toward the floor of the mouth. This action in the lower jaw reduces the arc in the anterior part of the arch and results in crowding of the teeth.

5. This condition is progressive, becoming steadily worse as the vertical dimension is lost. The lower anterior teeth are crowded between the two lower cuspids under relaxed conditions of the jaws. Every time the jaws close, the lower anterior teeth receive further injury by striking the lingual surfaces of the upper teeth.

6. The power of the masseters is then transferred to the labial surfaces of the lower teeth in one instance and the lingual surfaces of the upper teeth in the other. Both forces are highly destructive to all physiologic balances of the biologic structures. They create a condition of gross fatigue and prepare either the lower teeth or the upper teeth, or both, for early loss without any relation whatsoever to the third molar, whether it be present, or congenitally absent.

7. The approach used in this plan required absolutely no contact of the anterior teeth in the centric position of the jaws. Pressures exerted by the lower teeth against the upper teeth are absolutely not permitted, except in the act of incision wherein the impacts are favorable to both upper and lower teeth. This act is cherished and perfected by grinding so that the total blow exerted will be evenly distributed among as many teeth as possible.

### **A Fundamental Law in Oral Dynamics**

In support of the theory concerning force-effects on the lower teeth, oral dynamics presents another fundamental law: The *law of compensation*, which clearly states that for every act there must be an equal and opposite re-act.

**Application to Physiology of the Anterior Teeth**—In applying the law of compensation to the physiology of the anterior teeth mechanical impacts must be carefully analyzed to prove the violation. For example, a post placed in the ground with the proper amount of support would permit continuous impacts on its top sur-

face provided they were reasonable in proportion to the size and foundation of the post. These impacts would tend to set the post more firmly in the ground. However, if the blows were directed on the side of the post, near the top, they would throw severe strains upon the end of the post which was in the ground and eventually dislodge the post from its supporting foundation.

**Function of the Masseter Muscles**—The powerful masseter muscles were intended to exert their greatest force upon the molars and their lesser force upon the bicuspids. This again follows a natural law. There should be no force at all on the anterior teeth in the centric position unless they are in an end-to-end bite relationship. Even here, the amount of strain permitted on the molars and on the anterior teeth is controlled by the rate of dissipation of the muscle energy from the point of attachment.

**Proper Dissipation of Force Pattern**—1. The point at issue in this discussion is that the force pattern should be dissipated upon the teeth that were designed to absorb it.

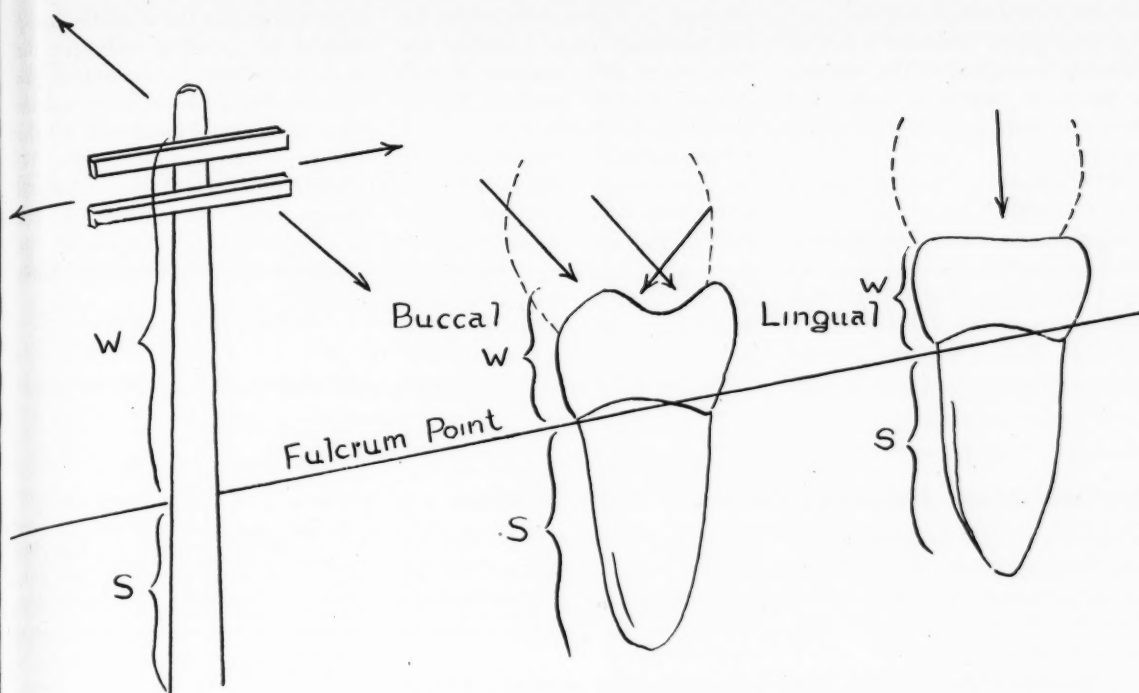
2. Under no condition should any part of the power of the muscles of mastication be absorbed upon surfaces that were neither designed nor intended to receive it.

3. An examination of the bone supporting the anterior teeth shows emphatically that (1) neither the bone foundation, (2) the blood supply, nor (3) any of the anterior structures were ever designed for the mastication function that belongs to the posterior teeth.

**Function of the Anterior Teeth**—The act of incision is distinctly the only function that the anterior teeth should enjoy and it is extremely important that they do enjoy these functions.

**The Value of Properly Delivered Impact**—The author will attempt to show that properly delivered impact upon a tooth is the principal means through which the tooth can receive its blood supply and, consequently, maintain not only its nutritional requirements but also its defensive organization against bacterial invasion.





W = Working Arm  
S = Supporting Arm

4

### The Fulcrum Point

**Definition**—The fulcrum point is that point from which the solid supporting structure terminates and the projecting, unsupported structure departs. Gingival tissue does not necessarily locate the fulcrum point because it is not considered supporting structure. Nothing but solid, healthy bone can determine the fulcrum point, regardless of location. It is this point which determines the working arm and the supporting arm. It applies to teeth, poles, posts, or any other object supported from a fixed foundation.

**The Fulcrum Point in Dentistry**—The fulcrum point is a highly critical factor in diagnosis, particularly in reading x-ray pictures.

The fundamental law of the lever, which involves the fulcrum point, enters into every movement in the act of mastication. This law operates constantly and while it can never be violated, it can definitely be controlled or completely nullified.

**Diagram 4**—The comparison between a telephone pole and two posterior teeth is shown, one contour representing civilized mouths and the other describing the contours of primitive teeth. The purpose of the drawing is to illustrate the effect of the fundamental law when activated by force. As far as the pole is concerned, the engineer has latitude and sets the post according to the following equation:

$W < S$  (Working Arm is less than Supporting Arm).

**Provisions of the Equation**—This equation not only provides for supporting the pole with excellent security but renders a safety factor that anticipates any unusual strains above the normal requirement of the working arm (that part of the post exposed above the fulcrum point).

**Nature's Equation**—By comparison, Nature uses the same law. The crown part of the molar in civilized mouths represents working arm while the root section represents the sup-

porting arm. Apparently Nature elects to use equations of exact proportions. This equation, verified by the author's observations, is  $W = S$  (Working Arm is equal to Supporting Arm).

### Modifications Planned by Nature

—The molar indicated erupts at the approximate age of six with muscle power factors much lower than will ultimately be developed for adult life. Nature planned that by the time this tooth reached adult life there would be a change: (1) Not only was the length of the crown or working arm shortened, but (2) the extremely important lateral strains were reduced when the cuspal topography was modified. If the reader cannot concede the accuracy of this statement he must be prepared to prove that Nature violated her own law, which is, of course, inconceivable.

**State of Violation**—However, the law is violated when cuspal topography is not modified by the time the muscles of mastication reach their

full stage of development and exert the total power intended by their anatomic arrangement. The equation at this point must stand reversed if there has been no change in cuspal anatomy:

W>S (Working Arm is greater than Supporting Arm).

*Compensation by Elimination*—The deplorable fact is that no structure, either physical or biologic, can long endure in the presence of this violation. Many conditions are instituted which, slow at first, are ac-

celerated in a geometric ration that will ultimately cause complete loss. This brings about compensation by exterminating the members that are in a state of violation.

*Intervention Necessary*—The dentist must recognize this critical point in the lives of civilized people and intervene as soon as the developmental characteristics of cuspal topography are completed by furnishing relief from further changes through grinding.

The specific warning is expressed,

however, against the unstudied adoption of any grinding technique that seeks to imitate the correction provided by Nature in primitive mouths. This is an oversimplification that could produce harmful results. The method advocated in this work, although based on natural bite correction, has been scientifically developed to meet present-day conditions.

(To be continued)

5510 16th Street, N.W.

## ***Inhalation During Dental Extraction***

IN A STUDY of 316 nonmalignant lung abscesses Brock<sup>1</sup> found that 7 per cent occurred after the removal of teeth. He suggested four main causes for this sequel:

1. Multiple extractions under deep anesthesia.
2. The extraction of septic teeth with tartar masses.
3. The upright position of the patient in a dental chair.
4. Inexpert anesthesia.

Fry and Earl<sup>2</sup> have now published a preliminary report of their attempts to assess the importance of each of these factors in encouraging the inhalation of blood and other debris during dental extraction. They investigated two small series of patients by injecting 2-3 milligrams of radio-

paque oil into the buccal sulcus before or during the extractions and radiographing the chest within thirty minutes of the patients' return to consciousness:

1. In the first series of unselected patients undergoing extractions under nitrous oxide anesthesia none inhaled a demonstrable quantity of oil.
2. The second group was of 14 patients subjected to multiple extractions, two of whom were anesthetized with trichlorethylene and the remainder with nitrous oxide. The oil was injected midway through the operation when the throat pack was soaked in blood. Only one patient (a man who had seven teeth extracted) was found to have inhaled the oil which was seen in the right lower lobe bronchus.

*Evidence Inconclusive*—The num-

ber of patients studied by Fry and Earl is too small to allow firm conclusions to be drawn. The radiopaque oil used was not miscible with blood and was usually about one-tenth of the volume of blood in the mouth. That no oil was inhaled is therefore no indication that blood was not.

*Further Investigation Justified*—The experimentation by Fry and Earl has demonstrated that inhalation can occur during dental extraction without the knowledge of the operator. Similar investigations on a larger number of patients is justified, preferably with a radiopaque substance that mixes freely with blood.

Adapted from *British Medical Journal* No. 4685:936 (Oct. 21) 1950.

<sup>1</sup>Guy's Hosp. Rep. 96:141, 1947.  
<sup>2</sup>Ibid., 99:41, 1950.

## ***The Cover***

THE COVER designs for the January and February 1951 issues of DENTAL DIGEST were reproduced through the courtesy of *The Cancer Bulletin* and were adapted from the covers used in the November-December, 1949 issue of that publication.

The cover this month shows the principal external anatomic sites of primary and metastatic cancers of the head and neck. The numbers refer to the following sites: 1. Skin of the face. 2. Auditory canal. 3. Parotid gland. 4. Maxillary sinus. 5. Nasal canal. 6. Bones of the head. 7. Lip. 8. Thyroid. 9. Parotid nodes. 10. Upper jugular nodes. 11. Submaxillary node. 12. Subdiaphragmatic node. 13. Spinal accessory node. 14. Mid-jugular nodes. 15. Submental nodes. 16. Lower cervical nodes.

## NEUROLENE for Inhalation

### Anesthesia and Analgesia

LOUIS WILLINGER, D.D.S., New York

#### DIGEST

*There has been a prolonged search for a gas-oxygen anesthetic which would maintain the oxygen content of the blood at a normal level throughout the anesthesia.*

*With nitrous oxide and oxygen, the oxygen content of the blood is markedly reduced.<sup>1</sup> Balanced anesthesia involves the employment of several agents to obtain anesthesia by using therapeutic doses of each, rather than a possible toxic dose of one.<sup>2</sup>*

*Research and clinical experience in the use of neurolene as a synergetic agent in combination with nitrous oxide-oxygen proves that a long step forward has been made in the quest for an ideal general anesthetic for the ambulatory patient. With nitrous oxide, oxygen, and neurolene the normal oxygen content of the blood can be maintained throughout the anesthesia.<sup>3</sup>*

*Step-by-step directions for a technique that has been successfully used in administering the agent are given herein.*

#### General Considerations

The greatly increased quantity of oxygen which neurolene ® (trichloroethylene U.S.P. and ether U.S.P.) makes possible sustains satis-

factory anesthesia with comparative ease and safety.

In the final analysis the success of inhalation anesthesia is dependent upon a careful evaluation of the physical and mental status of the patient

and operative limitations rather than upon the type and variety of drugs, administration techniques, and related factors.

Because neurolene differs in its characteristic from other inhalation anesthetics, it is recommended that before administering it for the first time the anesthetist acquire practical



**1.** Chair tilted backwards to a thirty-degree angle, restraints fastened, mouth prop in position. Anesthesia has been established. Heidbrink Simplex apparatus, nurse holding nosepiece in position with right hand, left hand holding aspirator tip. Operator extracting lower tooth.

<sup>1</sup>Sheinman, Kannon: An Evaluation of Anesthesia in Medical and Dental Office Practice, D. Items Interest 72:339 (April) 1950.

<sup>2</sup>Gwathmey, James T.: The Open Method of Nitrous Oxide-Oxygen Anesthesia. Read before the Eighth Annual Meeting of the American Association of Anesthetists, New Orleans, April 26-27, 1920.

<sup>3</sup>Willinger, Louis: General Anesthesia, D. Items Interest 71:1283 (Dec.) 1949.





**2.** Patient manifesting signs of distress. Restraints loosened. Throat curtain removed. Operator raising chin with left hand and gently pressing abdomen with right hand. Nurse giving patient 100 per cent oxygen with left hand.

knowledge of its administration under the guidance of one who has had ample experience.<sup>3</sup>

**Indications for Use**—Neurolene is an efficient synergetic agent to complement nitrous oxide-oxygen in inhalation anesthesia with increased safety<sup>4</sup> for the following:

1. Ambulatory office patients.
2. Operations of short duration.
3. Rapid smooth induction.
4. Maintenance of anesthesia with greater muscular relaxation and the elimination of hypoxia and anoxia.

**Contraindications**—A semiclosed circuit should be employed for the administration of nitrous oxide-oxygen and neurolene. When neurolene comes in contact with soda lime it

breaks down and forms acids and other deleterious products. This precludes its use in a close circuit.

There are few contraindications for the use of nitrous oxide-oxygen-neurolene anesthesia for the ambulatory office patient. Outstanding among these are (1) patients obsessed with extreme fear of being rendered unconscious, (2) those who absolutely refuse general anesthesia, and (3) patients who present themselves with nasal infections and obstructed nasal passages through which gases could not flow freely.

For patients considered poor anesthetic risks, the use of procaine is indicated.

**Advantages**—1. Induction is quick, quiet and effortless, and recovery is rapid.

2. Administration is not complicated and is easily controlled.

3. Undesirable side reactions are few and of little consequence.

4. The percentage of unfavorable postanesthetic effects is small.

5. Administration is usually considered pleasant by the patient.

6. The therapeutic quotient for the production of anesthesia is sufficiently high to be considered safe.

7. The agent is not expensive as a small quantity of neurolene is required.

8. There is no explosion hazard.

9. Peripheral analgesia is present.<sup>5</sup>

It was noted that following the return to consciousness the oral tissues remained insensible to pain for a period of from two to five minutes. This analgesia effect makes possible (1) the reduction of interproximal papilla (2) the smoothing of sharp alveolar processes, (3) curettage of granulomas or bone pathosis, and (4) any indicated suturing. The ensuing analgesia is sufficient to permit the surgeon to complete minor operative procedures painlessly while the patient is recovering from the anesthetic.

10. Neurolene has antispasmodic properties for relief of choking due to pharyngitis, tracheitis, or bronchitis.

11. Dilatation of capillaries is absent, thus resulting in a minimum of bleeding during operative procedures.

12. Administration over prolonged periods produced no shock.<sup>6</sup>

### **Chemical and Physical Properties**

The principal ingredient of neurolene is trichloroethylene. The small amount of ether added increases vaporization of the mixture and aids in obtaining greater muscular relaxation during induction and maintenance of anesthesia.<sup>7</sup>

**Chemical Formula**—Trichloroethylene has the chemical formula  $CCl_2:CHCl$ . It is a clear colorless liquid having an odor resembling chloroform without its pungency. The

<sup>3</sup>Bellows, Rowland T.: Tri-Facial Neuralgia. *South. Med. & Surg.* 105:255 (June) 1943.

<sup>6</sup>Elam, T.: Trichloroethylene Anesthesia, *Lancet* 2:309 (September) 1942.

<sup>7</sup>Galley, A. H.: Trichloroethylene in Dental Surgery, *Lancet* 2:597 (November) 1945.

<sup>4</sup>Ostlere, G.: The Role of Trichloroethylene in General Anesthesia, *Brit. Med. J.* 1:195 (January) 1948.

specific gravity is 1.47. Boiling point 87° Centigrade. It is not inflammable nor will its vapor explode when mixed in any proportion with air. It will mix with diethyl ether without chemical reaction. Pure trichloroethylene tends to decompose in strong sunlight and air to form toxic products, hence the advisability of storage in well-stoppered, dark containers.

**Effects Nonirritating**—Investigations on the effect of trichloroethylene vapor have revealed that it is nonirritating to the respiratory tract and nontoxic to the liver. Tachypnea, brachycardia, tachycardia, and other cardiac irregularities were noted only when the agent was pushed too vigorously. Arrhythmias may be easily controlled by increasing the oxygen plane.

### **Technique of Administration<sup>3</sup>**

1. The patient is seated in the chair, tilted to a 30-degree angle.

2. All sterilized instruments needed for the operation and possible anesthesia emergency are carefully laid out on a table in back of the chair. A filled procaine syringe should be close at hand.

3. While the nurse drapes the patient a capable assistant can prove invaluable in helping to induce a desirable state of calm and relaxation. *The extremely nervous patient may require premedication about three quarters of an hour before anesthesia is started.*

**Patient Relaxation Important**—It is impossible to start anesthesia and expect good results when patients manifest a highly emotional state or excessive fears. After a patient is relaxed and x-ray and clinical examination is made the following steps are taken. 1. The field of operation is dried and fixed with iodine and a mouth prop placed in position as far away from the operative area as possible.

2. With the Heidbrink Simplex apparatus the dials are set at 3 gallons per minute, 15 per cent oxygen.

3. The nose and mouth inhalers are gently adjusted, the patient is told to breathe normally, and after a few inhalations is assured that everything will be satisfactory.

4. The ether vaporizer which is attached to the apparatus and contains neurolene is set to permit the flow of about 40 to 60 drops per minute to mix with the nitrous oxide-oxygen.

(When a McKesson apparatus is used the technique is changed slightly).

**Use of Restraining Belts**—1. After about thirty seconds the restraining belts which are bolted to the dental chair and are the same as those used in airplanes, are firmly attached across the patient's chest, wrists, and thighs. The speed and smoothness of the anesthesia which ensues are gratifying.

2. In approximately one and a half to two and a half minutes the symptoms of anesthesia become clearly evident. Without further manipulation of the apparatus most patients enter into and remain in the first phase of the third stage and rarely manifest excitability.

**Indications of Depth of Anesthesia**—1. The respiratory activity will tell more about the depth of anesthesia than all of the other signs combined.

2. The color of the skin, the eye reactions, and the muscle activity are all secondary in importance to the character and quality of the respirations. "As the respiration goes, so goes the anesthesia" might almost be accepted as an axiom.

3. In a study of more than 2000 cases the few obstreperous patients became docile by increasing the pressure of the nitrous oxide and decreasing the percentage of oxygen to 10 per cent. The concentration of neurolene remains the same.

**Oxygen May be Added**—At no time should it be necessary to use more than 4 cubic centimeters of neurolene per minute. When a satisfactory plane of anesthesia is reached, 20 to 75 per cent of oxygen may be added to the nitrous oxide, depend-

ing upon the time required to complete the operation and the oxygen need of the patient.

**Concluding Procedures**—1. Most patients are maintained smoothly anesthetized for fifteen to twenty minutes with 35 per cent oxygen.

2. After about five minutes neurolene is discontinued until anesthesia shows signs of being too light.

3. At completion of surgery, to facilitate and speed recovery, the patient's lungs are flushed with 100 per cent oxygen.

4. The patient is then helped into a rest room where he may either recline or be seated. Within ten to fifteen minutes the average patient is capable of departing for home.

### **Discussion**

1. Many patients who have had unpleasant experiences under nitrous oxide-oxygen anesthesia on previous occasions behaved extremely well.

2. Many patients whose previous records indicate that they were obstreperous in different degrees under nitrous oxide-oxygen reacted remarkably well under this synergetic nitrous oxide-oxygen anesthesia.

3. Dentists experienced in general anesthesia who have witnessed the clinical demonstrations of the technique described were favorably impressed at (1) the ease of administration, (2) smooth induction, (3) freedom from excitability, (4) even maintenance, (5) rapid recovery and insignificant postoperative nausea.

### **Conclusion**

It is believed that the objective has been reached in the search for an anesthetic agent that permits any percentage of oxygen that a patient may require when used in combination with nitrous oxide. This synergetic mixture has widened immeasurably the anesthetic range of nitrous oxide and to that extent increased the ease and safety of its administration.

355 East 149th Street.

# The Correction of TRAUMATIC OCCLUSION

## by Articulator Analysis

L. C. HOLTZENDORFF, D.D.S., Valdosta, Georgia

### DIGEST

*The clinical, histopathologic, and mechanical aspects of traumatic occlusion have been thoroughly presented in the dental literature. Dentists are well aware of this oral dysfunction and of the need for its correction as part of the over-all treatment of (1) periodontal disease, (2) temporomandibular disturbances, and (3) allied oral disorders.*

*It is recognized that traumatic occlusion should be corrected by equilibration of the occlusion and the benefits from such treatment are also recognized but many practitioners hesitate to undertake the correction of this malfunction. One of the reasons for their reluctance is the lack of a clear, easily followed technique for selective grinding.*

*The outstanding feature of the technique for correction of traumatic occlusion demonstrated in this article is a method which discloses graphically the areas requiring selective grinding. The occlusion is corrected on an articulator; the correction areas are then transferred to the natural teeth.*

*Correction of traumatic occlusion on an articulator permits the operator (1) to visualize all phases of the operation, (2) affords full control over jaw movements, and (3) permits selective marking of the teeth.*

### Factors Which Make Correction of Occlusion in the Mouth Difficult

1. The patient's inability to give correct positions or movements during operative procedure.

2. Inaccessibility of the posterior teeth, particularly the lingual cusps.

3. Masking effect of the tongue, cheeks, and saliva.

4. The inability of the operator to see occlusal contacts on working and balancing side simultaneously.

### Technique for Correction of Occlusion on an Articulator

1. Impressions of the upper and lower teeth are taken in elastic impression material and poured in stone.

2. The centric relation and protrusive relation, taken with the anterior teeth in an end-to-end bite, are obtained with red baseplate wax luted on to a T-shaped piece of dead soft shim brass, .005 inch thick (Fig. 2).

3. If it can be determined that the patient's centric position is a true locked centric with no premature occlusion of any opposing teeth, taking the centric position with a wax bite may be omitted and the models may be set on the articulator in the centric position.

*Transfer of Condylar Relationships*  
—1. The models are mounted by a face-bow on an adjustable articulator



1. Stone models and accessory supplies required in the technique described.



**2. Thin dead soft sheet brass is cut to a T-shape as on the left. Red baseplate is luted to it in three places and the bite is taken as illustrated on the right.**

in centric using either of the methods outlined.

2. The accurate transfer of condyle-arch relationships from the mouth to the articulator is indispensable in this technique.

3. The condylar inclinations are adjusted by the use of the protrusive registration as described above. The table which supports the articulator pin should be adjusted so that it is parallel with the occlusal plane of the teeth.

4. The stone teeth on the articulator setup will then have occlusal relations and movements which reproduce those of the patient's teeth and there will be similarity of occlusal markings.

**Method for Occlusal Marking**—Occlusal markings of the models may be simplified by using a contrasting color and marking system applied as follows:

1. Coat the teeth with one coat of clear fingernail varnish. This acts as a sealer. When this is dry, paint on a coat of light green, model airplane dope. The purpose of the clear varnish is to prevent the green dope from penetrating into the stone model (Fig. 3).

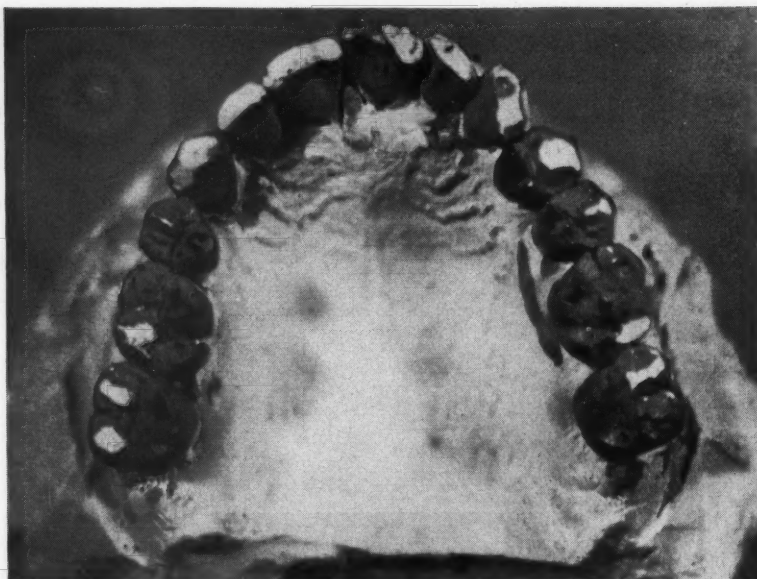
2. After the green dope is dry the articulator condyles are locked in centric and the articulator pin is raised and locked out of contact with the table.

3. Red articulator paper is placed between the teeth and the centric occlusal contact points are registered by occluding the models. The use of red for the centric position is symbolic in that red is a danger signal and in selective grinding the red or centric markings will be avoided.

**3. Applying the coloring dope to the model teeth prior to articulator manipulation.**

**4. Folded metal foil x-ray backing is placed between the anterior teeth to disocclude the models.**





**5. Adjusted model of practical upper case illustrating: 1. Coloring on stone teeth. 2. Centric occlusal markings. 3. Scraped (white) areas on occlusal and incisal surfaces indicating points requiring occlusal adjustment.**

#### *Protecting the Centric Position—*

Before making the eccentric markings it is necessary to disocclude the articulator in the centric position (1) to prevent double marking with two carbon paper colors, and (2) to protect the centric position. This is accomplished in the following way: 1. Fold a metal backing from an x-ray film to eight thicknesses (approximately  $\frac{1}{2}$  millimeter), place it between any of the anterior occluding teeth, and then press the upper against the lower model.

2. With the models held together the articulator pin is brought into contact with the table and locked in place (Fig. 4).

3. The folded x-ray backing is then removed and discarded. Its purpose was to disocclude the models to protect the centric markings. When the articulator pin is locked in this position the models fail to occlude by approximately  $\frac{1}{2}$  millimeter in the anterior region when in the centric position. There will continue to be contact in the eccentric positions due to cuspal height.

**Movement Permitted in Lateral Direction—**1. The next step consists of unlocking the centric lock on one

side of the articulator to allow movement in one lateral direction.

2. Blue articulator paper is placed between the stone teeth and the articulator is slowly moved into the lateral position. This is best done by grasping the articulator pin with one hand and moving the upper model slowly out into the lateral position.

3. When blue markings show up on the buccal incline planes of the upper teeth or lingual incline planes of the lower teeth these areas on the articulated models should be scraped with a sharp knife and the corresponding areas in the mouth ground simultaneously.

**Occlusal Adjustment—**1. The reason for choosing green as the tooth coloring medium is evident. Both red and blue carbon paper markings can be seen against a green background but when the green coating on the stone teeth is scraped away the yellow or white of the stone model will be revealed as the area of occlusal adjustment.

2. Adjustments are made first with the pin just lateral to centric position. The pin is gradually moved out farther in a lateral direction and ad-

justment is continued as it moves out from centric. Adjustment should be bilateral at the same time, adjusting for working and balancing side simultaneously.

3. When one lateral movement has been adjusted, the centric lock on that side is closed and the opposite side is opened, permitting the opposite lateral movement which is then adjusted in a like manner.

**Adjustment of Lateral and Protrusive Movements—**1. After the lateral movements have been corrected, both centric locks are released and the protrusive movement is adjusted.

2. At this time all positions between the laterals and protrusive positions are explored and adjusted.

3. These articulator corrections should be done at the chair and the corresponding teeth in the patient's mouth ground at the same time. There are certain rules to follow in adjusting the occlusion which if deviated from cause more harm than good.

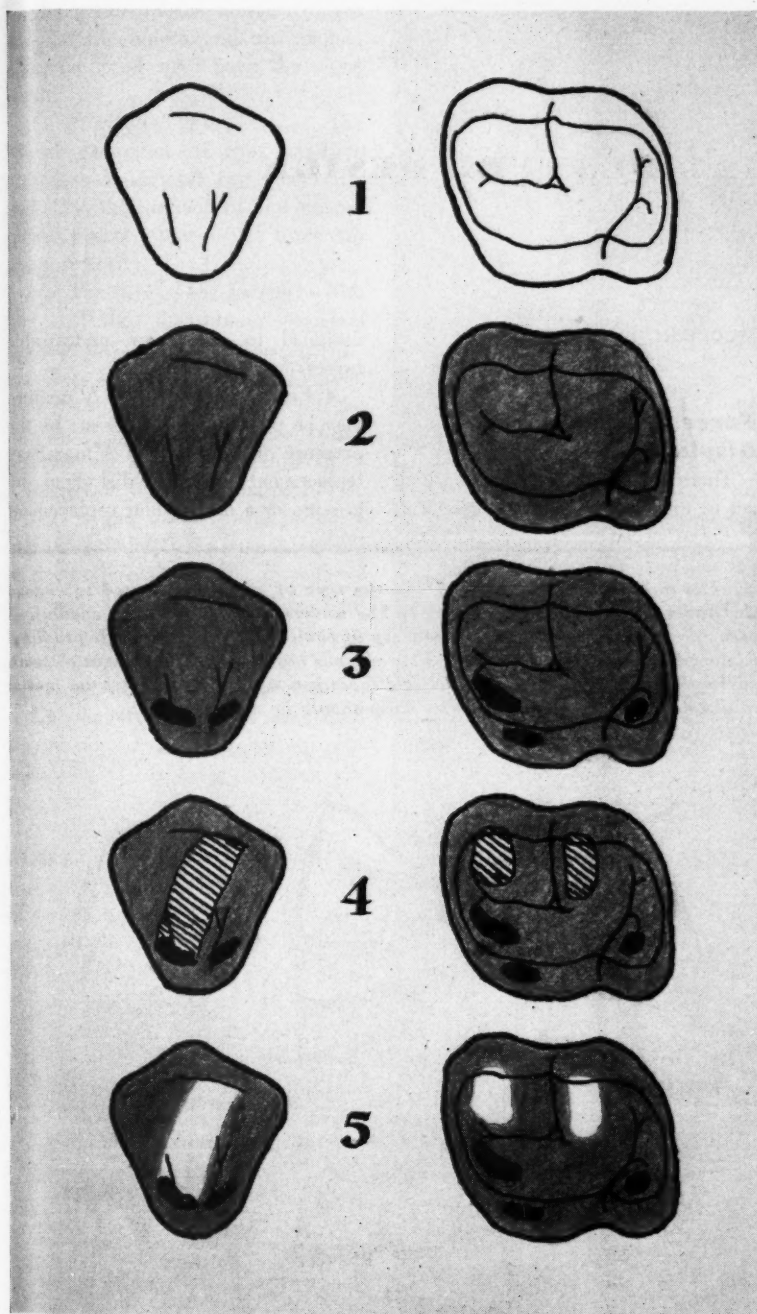
#### **Basic Principles in Adjustment Procedure**

1. Premature contact in the centric position should be corrected before any eccentric correction is done. In correcting premature contact in centric position, if there is premature contact in centric and eccentric positions the cusp or incisal edge should be relieved; but if there is interference only in centric position the opposing groove should be relieved.

2. After any spots of premature contact in centric are relieved, avoid grinding areas which maintain the centric relation. Thus the same vertical distances between arches are maintained.

3. Avoidance of the red or centric marking in the protrusive positions means avoidance of any adjustment of the lower anterior teeth. Most adjustments should be done on the lingual incline planes of the upper anterior teeth. An exception to this rule occurs in cases where it is desired to take the lower anterior teeth temporarily out of contact for comfort.

4. In severe overbite cases it is seldom possible to relieve enough to



6. Drawing of tooth surfaces illustrating steps in technique: 1. Bare tooth model surfaces. 2. Coloring dope applied to teeth. 3. Centric markings in red on teeth (solid color in illustration). 4. Eccentric markings in blue on teeth (cross hatching in illustration). 5. Area of eccentric markings scraped revealing white surface of stone model.

obtain posterior contact in the protrusive position but as many anterior teeth as possible should be brought into contact at the same time in order to distribute the occlusal stress.

5. In correcting the working side, correct the guiding planes only — the occlusobuccal plane of the buccal cusps of the upper teeth. At the same time the balancing side should be cor-

rected by relieving the occlusolingual guiding plane of the lingual cusps of the lower teeth. One balancing contact is sufficient but as many working contacts as possible should be brought into function.

6. Although seldom attained, the ideal condition is that in which each tooth is in contact in centric and eccentric positions. If there is extensive flattening of the occlusal surface of a tooth by grinding, the occlusal anatomy should be restored.

7. The buccal cusps of uppers, the lingual cusps of lowers and incisal edges should not be left sharp but should be well rounded and all ground surfaces should be polished and varnished before the patient is dismissed.

### Comments

1. Extensive occlusal adjustments should not be completed at one sitting but should be divided among several sittings.

2. The technique described is intended as a supplemental method of correcting traumatic occlusion and is not a substitute for any of the methods now in use for correcting this oral dysfunction.

Valdosta, Georgia.

### The Rest Position of the Mandible

THE rest position of the mandible may be defined as that position in which the mandible involuntarily is suspended by the reciprocal coordination of the muscles of mastication and the depressor muscles with teeth separated. In other words, the jaws are separated by the minimum amount of muscular contraction sufficient to overcome gravity. This position prevails from the time man is born until he dies. It makes no difference whether the patient is edentulous or not; asleep or awake, it is an anatomic and physiologic arrangement<sup>1</sup>.

<sup>1</sup>Niswonger, Obtaining the Vertical Relation in Edentulous Cases that Existed Prior to Extraction, J.A.D.A. 25:1842 (November) 1938.



# Principles of PARTIAL DENTURE DESIGN

HENRY A. COLLETT, D.D.S., Commander (DC) USN, Philadelphia

## DIGEST

To design dentures correctly it is necessary to know their functions in the mouth as well as the physical laws that govern the functions.

Where occlusion has been lost the teeth remaining in the mouth may be under excessive stress. Those next to an edentulous space will tend to migrate toward the space. In addition, the teeth opposite an edentulous area may either extrude or exfoliate.

This article outlines the basic principles involved in the design of partial dentures and describes in detail the various parts of the denture and the specific application of each.

## Function of the Partial Denture

Among the various important functions of a partial denture are the following:

1. The restoration of the occlusion is the most important.
2. The remaining teeth will be better preserved and restored to function.
3. A denture will restore the patient's appearance, enable him to eat with comfort, and improve his mental attitude.

The opinions and assertions contained in this article are the personal ones of the writer and not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

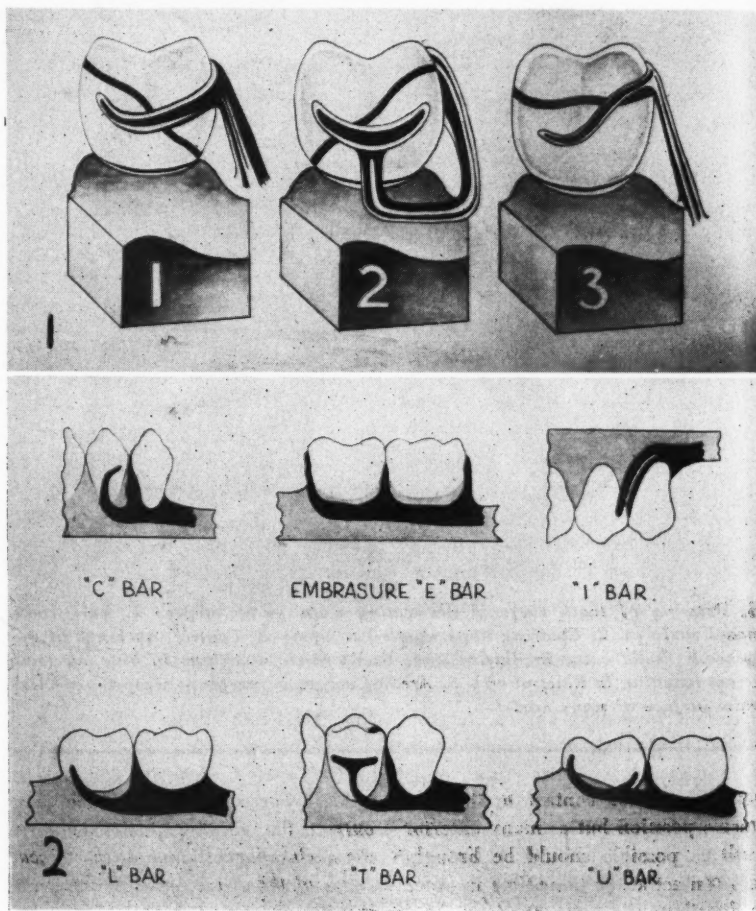
## Forces Which Tend to Displace a Denture

There are a number of forces which act to displace a denture unless it is

designed to counteract undesirable forces:

*A Vertical Force*—(1) A denture may be pushed into the tissue by the pressure of the bite. (2) A maxillary replacement may be dislodged by gravity, or a mandibular replacement

1. The three basic surveyor lines and the type of clasps best suited to engage the undercuts illustrated by them. 1. The undercut is distal to the edentulous area; therefore, a cast ringlet is the clasp of choice. 2. The undercut is proximal to the edentulous area; therefore, a bar clasp is indicated. 3. The height of tooth contour is near the occlusal surface and there is a marked undercut from mesial to distal; therefore, a wrought wire clasp should be used.



## 2. The various types of bar clasps.

by the action of the muscles of the floor of the mouth and the tongue. Adhesive food may have the same result.

**A Horizontal Force**—(1) The lateral excursion of the mandible creates a horizontal force laterally, and (2) the impact of the cuspal planes exerts a horizontal force anteroposteriorly.

**Bite Pressure of the Incisors**—The bite of the mandibular incisors against the lingual surface of the maxillary incisors produces (1) pressure in a forward direction on the maxillary teeth, and (2) backward pressure on the mandibular teeth.

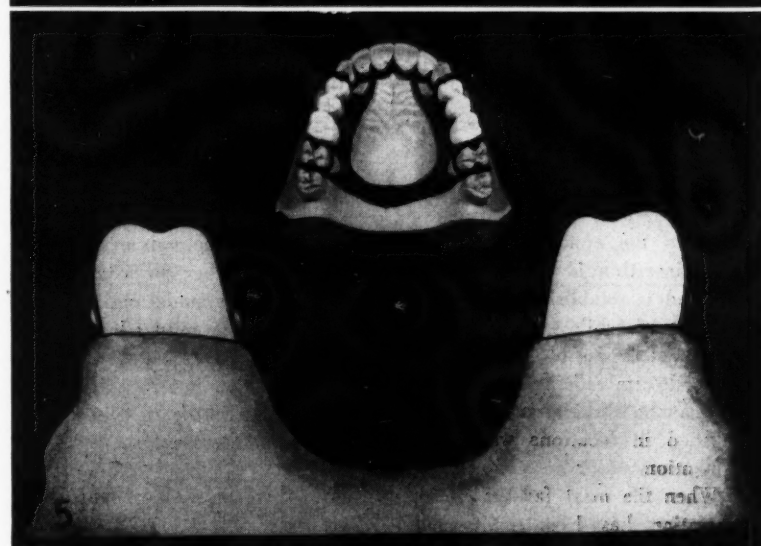
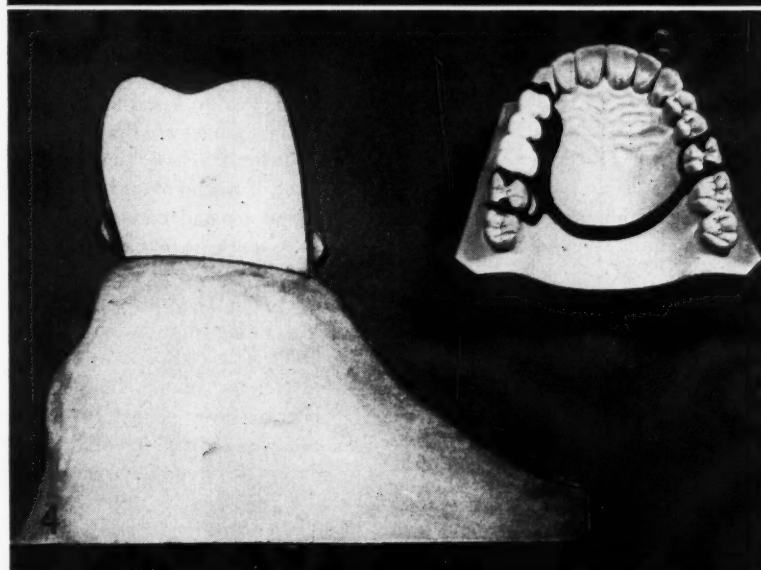
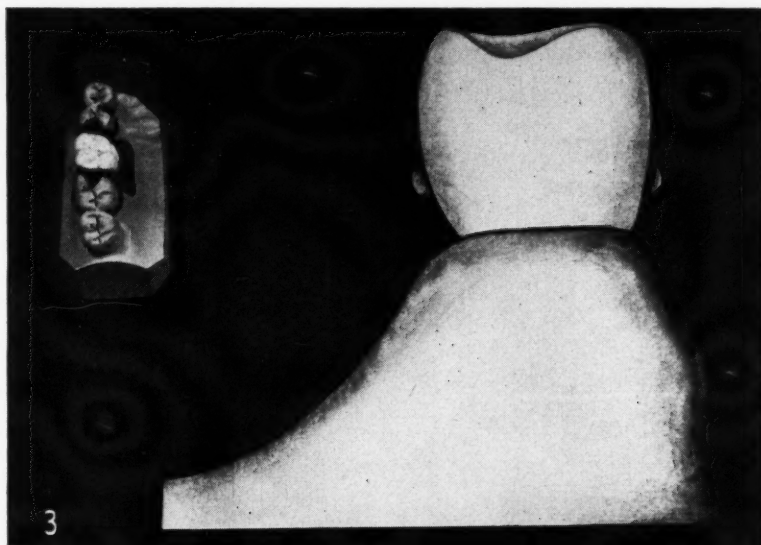
**Reduction of the Effects of Forces**—(1) If the occlusion is properly balanced, and (2) the cuspal inclines of the replacement teeth are reduced as much as occlusal harmony with the remaining natural teeth will permit, the effect of the various forces will be minimized, but not eliminated.

The construction of a successful partial denture requires careful consideration of the design of the separate parts.

### Clasps

It is impossible for the human eye to determine accurately the undercut areas of the teeth in relation to each other.<sup>1</sup> For this reason a surveyor should be used in designing clasps.

**The Surveyor**—The instrument consists of a movable vertical spindle or analyzing rod which is attached to a base by means of a vertical standard with a horizontal arm. On the

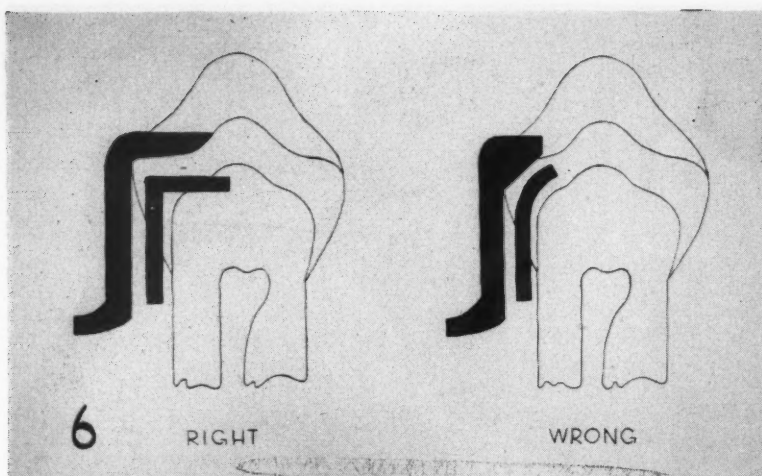


**3. Clasps on unilateral dentures must engage undercuts on each side of the clasped teeth.**

**4. If it is not possible to engage undercuts on both the buccal and lingual aspects of the abutment teeth with the clasps of a unilateral denture a connector must be used.**

**5. In bilateral cases it is not necessary to engage undercuts on both the buccal and lingual aspects of each tooth as sufficient retention may be obtained by engaging undercuts on similar aspects of teeth on each side of the arch while the other sides are braced by rigid arms.**

<sup>1</sup>Wills, N. G.: Dental Model Surveying, DENTAL DIGEST 41:222 (July) 1935.



6. When an occlusal rest is used, the pressure it exerts should be in the direction of the long axis of the tooth so that wedging will not cause undue stress.

base is a movable survey table with a tilting top.

**Purpose of the Surveyor**—1. The surveyor aids in determining the path of insertion of the denture and in determining the height of tooth contour.

2. When a model is properly surveyed the denture will follow a definite path of insertion and can be placed in position without difficulty. The clasps will function in correct relation with each other. In a model constructed without the use of a surveyor it is sometimes necessary to spring the connectors of the denture to place it in position.

3. Both undercut and nonundercut areas of the teeth and soft tissue are located with the analyzing rod. Undercut areas are those below its point of contact.

### Procedure

1. Clasps insert in a direction parallel to the analyzing rod. The path of insertion is common to all clasps and is established by the tilt of the model while surveying. The location and degree of the undercuts are also determined in this manner. Some may be eliminated and others established in locations which will aid retention.

2. When the most favorable path of insertion has been determined, each tooth to be clasped is brought

into contact with a carbon marker and the survey lines are drawn on the abutment teeth. These lines are at the height of tooth contour. All areas below them are undercut. The undercut areas must be engaged by the clasps to retain the denture.

**Basic Clasp Design**—The survey lines determine the design of the clasp. There are three basic clasp designs from which to choose: (1) The bar or infra bulge, (2) the wrought wire circumferential, and (3) the cast circumferential clasp (Fig. 1).

All clasps function as retainers but the cast ringlet serves better as a brace against lateral stresses. Variations of the bar clasps include the following: C, E, I, L, and T<sup>2</sup> (Fig. 2). The choice of clasp is determined by the undercut to be engaged.

**Tilting the Model**—Most of the rules given for determining the correct tilt of a model for surveying are satisfactory.<sup>3</sup> It is not necessary to observe a number of complicated rules. Tilting the model until (1) undercuts are in the most advantageous position, and (2) the path of insertion is such that it will prevent dislodging while the denture is in use, is all that is necessary.

<sup>2</sup>Roach, F. E.: Principles and Essentials of Bar Clasp Partial Dentures, J.A.D.A. 17:124-138 (January) 1930.

<sup>3</sup>The New Surveyor Book. Hartford, Connecticut, The J. M. Ney Company, 1941.

**Function of Clasps**—1. Clasps are direct retainers of the denture and brace it against horizontal stress. 2. They prevent rotation and migration of the abutment teeth.

**Clasps on Unilateral Dentures**—Undercuts must be engaged on each side of the clasped teeth (Fig. 3). If this is not possible (1) because of the contour of the abutment teeth, or (2) because too many teeth for this type of denture are being replaced, it will be necessary to use a connector which extends to a tooth on the other side of the dental arch (Fig. 4). This will provide sufficient retention and help brace the denture against lateral stresses.

**Bilateral Dentures**—It is not necessary to engage undercuts on both the buccal and lingual aspects of each tooth in bilateral dentures. Sufficient retention may be obtained by engaging undercuts on similar aspects of teeth on each side of the arch, bracing the other sides by rigid arms (Fig. 5).

**Retention of Clasps**—1. The flexible part of the clasp may be located beneath an undercut area of the tooth while the denture is braced by a rigid part in an area where there is no undercut.

2. The clasp may be held securely by engaging undercuts on both sides of the tooth, permitting the clasp to grip the tooth.

3. Dentures often become unseated when a clasp not engaging an undercut is tightened.

4. In cases where no suitable undercuts are present they must be established with crowns or cervical inlays.

### Rests

Rests have the following important uses: (1) They will support the denture against vertical stresses, (2) keep the clasp terminal at its proper position, and (3) prevent both clasp and saddle impingement on the gingivae.<sup>4, 5</sup>

**Types of Rests**—Rests may be occlusal, incisal, or lingual. Every tooth

<sup>4</sup>Roach, F. E.: Principles and Essentials of Bar Clasp Partial Dentures, J.A.D.A. 17:124-138 (January) 1930.

<sup>5</sup>Beach, J. W.: Hygienic Removable Bridge-work, Dental Summary 36:443 (June) 1916.



next to an edentulous area should carry a rest.

**The Occlusal Rest**—When an occlusal rest is used, the pressure it exerts should be in the direction of the long axis of the tooth to prevent pressure on an inclined surface from undue horizontal stress on the abutment teeth (Fig. 6).

2. When the tooth is prepared to carry an occlusal rest just enough enamel should be removed so that the rest will be sufficiently strong.<sup>6</sup>

3. The rest should cover one-third of the mesiodistal diameter of the tooth and should extend well into the sulcus. The marginal ridge should be reduced slightly in this preparation.

**Incisal Rests**—Incisal rests may be used (1) on mesiodistal grip clasps, and (2) on anterior circumferential clasps where the bite will permit.

**Lingual Rests**—1. Lingual rests should not be placed on an anterior tooth unless the tooth is properly prepared to receive it. Without preparation the rest would be on an inclined surface and cause an unfavorable horizontal stress.

2. The preparation is made by inserting an inlay, which contains a slot, into the proximolingual surface of the tooth. The rest fits into the slot and in this manner the stress is exerted in the direction of the long axis of the tooth (Fig. 7).

### **Indirect Retainers and Bracers**

Inadequate bracing support may result in deterioration of the dental arch. To prevent this, continuous lingual bracers<sup>7, 8, 9</sup> (which will also act as indirect retainers) should be used on distal extension cases.

(1) When periodontoclasia is present, or (2) where a continuous lingual bracer would interfere with the occlusion in maxillary restorations, it may be advisable to resort to a lingual or palatal plate.

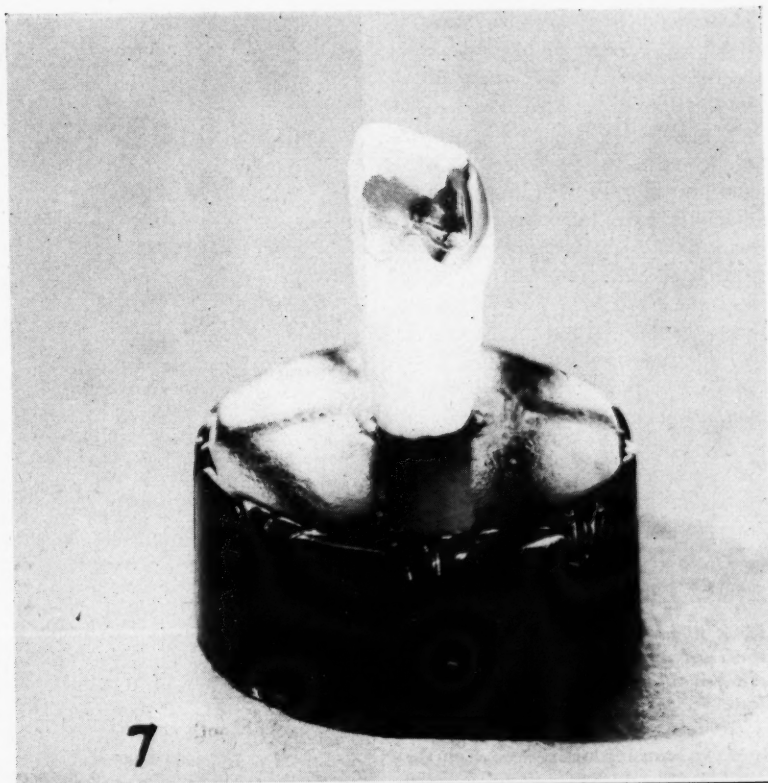
**Adequate Support Must be Pro-**

<sup>6</sup>Roach, F. E.: Principles and Essentials of Bar Clasp Partial Dentures, J.A.D.A. 17:124-138 (January) 1930.

<sup>7</sup>Woodworth, J. G.: Cast Continuous Lingual Clasp Removable Bridge Work, Dental Cosmos 64:290-300 (March) 1922.

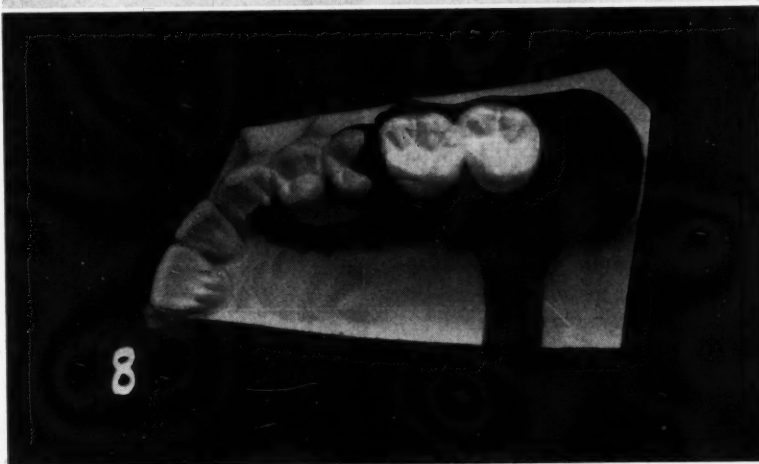
<sup>8</sup>Beach, J. W.: Hygienic Removable Bridgework, Dental Summary 36:443 (June) 1916.

<sup>9</sup>Kennedy, E.: Partial Denture Construction, Brooklyn, Dental Items of Interest Publishing Company, 1944, p. 430.



**7.** Inlay prepared to receive a lingual inlay rest.

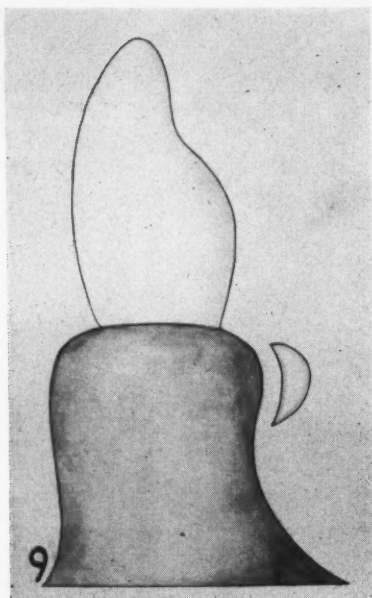
**8.** Extension arm indirect retainers are the least desirable because they do not distribute stresses.



vided—Bilateral appliances where many teeth on both sides of the arch are being replaced require continuous lingual bracers in order to provide adequate support against horizontal stresses. This part of the appliance should be placed over the cinguli where it will follow the general contour of the teeth.

**Limitations of the Clasp**—Although a clasp is a direct retainer of a denture, it retains only the end of the saddle to which it is attached; shifting of the distal end of the saddle will cause it to move up or down on the anchor tooth. More retention cannot be obtained by tightening the clasp because the saddle will continue





**9.** A lingual bar should be located at the crest of the tissue and should be relieved about  $\frac{1}{2}$  millimeter.

to move, causing undue stress on the abutment tooth. This eventually will break down its bony support.

**Indications for Indirect Retainers**—On distal extension dentures, for the reasons described, indirect retainers should be used. The indirect retainer should be extended beyond the retention point or fulcrum to counterbalance the saddle.

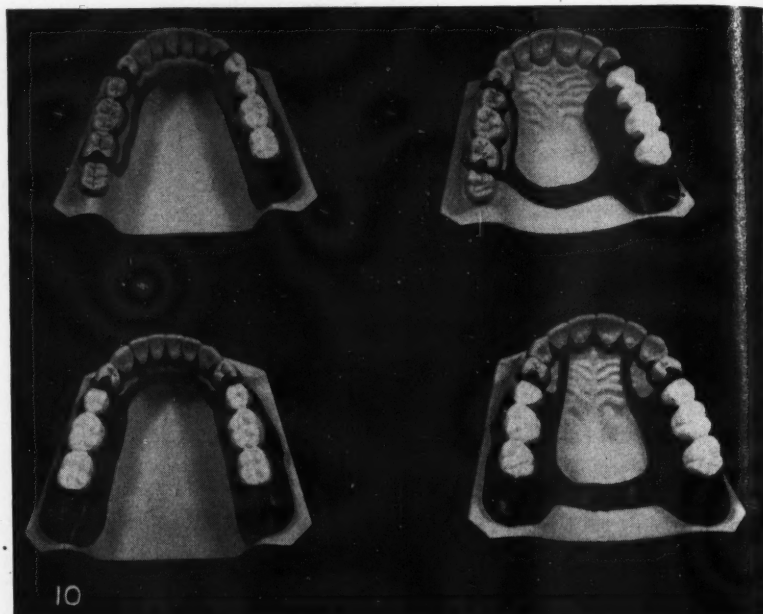
**Types of Indirect Retainers**—Of the three types of indirect retainers, (1) the continuous lingual brace, (2) lingual plate, (3) extension arm (Fig. 8), the least desirable is the extension arm because it does not distribute the stresses over as many teeth as possible. An extension arm may make the tooth on which it rests sore, or by constant pressure cause it to move.<sup>10</sup>

### Saddles

(1) Saddles act as vertical supporting elements on tissue-borne dentures, and (2) may also serve to brace the dentures against lateral and posterior forces.

**Importance of the Design**—1. Saddles which are too small may cause resorption of the underlying tissue

<sup>10</sup>Kennedy, E.: *ibid.* p. 256.



**10.** Designs for unilateral and bilateral distal extension dentures.

**11.** Designs for anterior replacements.

**12.** Other types of designs.

with consequent loss of support and soreness.

2. Trimming the saddle in these cases will not improve but will only increase the condition. Undue stress on the clasped teeth will result in their eventual loosening.

3. Saddles should be large and should take advantage of all the ridge support possible.<sup>11</sup>

4. A maxillary saddle should cover at least one-half the distance from the crest of the ridge to the midline palatally and should extend to the mucobuccal fold buccally, and should extend posteriorly to the hamular notch.

5. A palatal plate should cover the whole area of the rugae, and there should be a postdam of about one millimeter to prevent food from getting under the denture.

**Mandibular Dentures**—The horizontal thrusts on mandibular dentures are backwards when the mandible moves protrusively. The upward curve of the ridges from the bicuspid regions is a natural condition which braces the dentures against this force. To take advantage of this natural situation a saddle should be constructed with full buccal and lingual extensions and should be carried well on to the retromolar pads.

It will be found advantageous to relieve certain areas of the saddles, (1) over-prominent spots and slight depressions, or (2) places where healing is not complete.

Relief should also be obtained (1) over the rugae on palatal plates, and (2) in the area over the torus palatinus when it is covered by the denture.

### Connectors

The saddles of a denture must be united. This is accomplished by connectors which also stabilize the saddles. The connectors may be (1) palatal, labial, or lingual bars, or (2) lingual or palatal plates.

**The Use of Bars**—1. If bars are used, the bulk should be at a minimum as they give no actual support to the denture.

2. When a torus palatinus is present the narrow half-round bar relieved over this area is more satisfactory. Six-gauge metal is usually sufficient for a half-round bar but the bulk should be determined by its length.

3. Half-round palatal bars should be located in the first molar area with a posterior curvature for minimum tongue interference.<sup>12</sup>

4. In other maxillary restorations the wide flat bar covering two planes of the palate for strength will be found more useful because it will interfere less with the tongue. It may be advisable to use double connectors in two planes of the palate for added strength on some cases.

5. A lingual bar should be located at the crest of the tissue and should be relieved about one-half millimeter (Fig. 9).

6. Lingual and palatal plates should be constructed to fit into the interdental spaces and brace the denture. They should not be relieved in these areas.

**Function of Plates**—(1) The plates act as saddles, (2) they protect any existing periodontal pockets from further food impactions, (3) to some extent prevent loss of the bony supporting structures of the teeth, and (4) they function as lingual rests, brace against lateral stresses, and act as indirect retainers, and connectors.

### Summary

The manner in which the various parts of the partial denture function together is illustrated by the various types of dentures:

1. The unilateral and bilateral tooth-borne dentures (Figs. 3 and 5).

2. The type where the stress is divided between teeth and tissue. These include unilateral and bilateral distal extension dentures (Fig. 10). Dentures which replace teeth on the anterior curvature of the arch also belong in this category. In these anterior replacements the vertical stress is mesial to the clasped teeth; therefore, the bicuspid alone will not provide sufficient anchorage and it will be necessary to use the second molar together with a good saddle, lingual, or palatal plate (Fig. 11).

3. Cases where too few teeth are present to support the denture. These should be entirely tissue borne.

*U. S. Naval Hospital.*

<sup>11</sup>McLean, D. W.: Stabilization of Partial Dentures, J.A.D.A. 23:548 (April) 1936.

<sup>12</sup>Kennedy, E.: Partial Denture Construction, Brooklyn, Dental Items of Interest Publishing Company, 1944, p. 260.

## ***We Can't Pay You, But—***

No DENTAL author can ever be paid for a valuable technical or scientific article. The value of such material is above a monetary basis. In the preparation of a technical article, however, an author often spends money for drawings, photographs, models, or graphs. We should like to help

defray some of these expenses.

*Until further notice, DENTAL DIGEST will allow \$25.00 toward the cost of the illustrations provided by the author of every article accepted.*

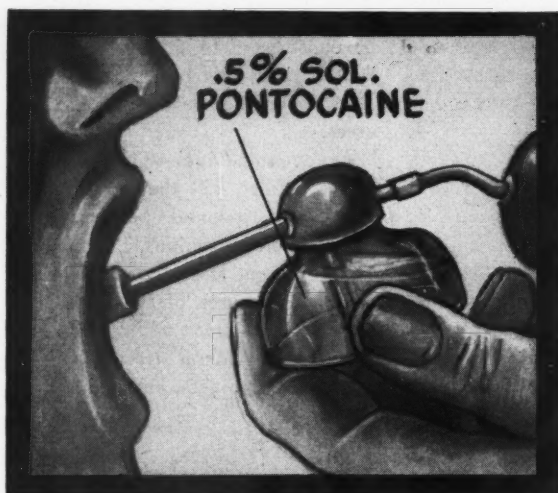
If you have a constructive idea, an innovation, a new result of tried and proved experiment, put it down in

writing, illustrate it, and send the material to: DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

We can make suitable black-and-white cuts from Kodachrome transparencies.

*We hope that you will accept this invitation!*

1



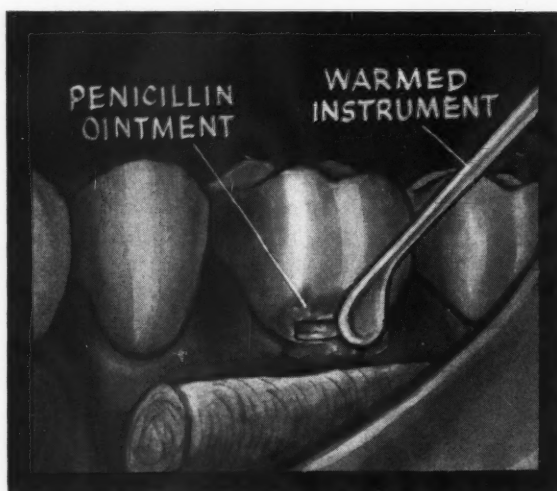
## Clinical and Laboratory

### Surface Anesthesia with an Atomizer

A. M. San Dretto, D.D.S., Racine, Wis.

1. To control gagging during any dental procedure use a 0.5 per cent solution of pontocaine in an atomizer to spray the throat.

2

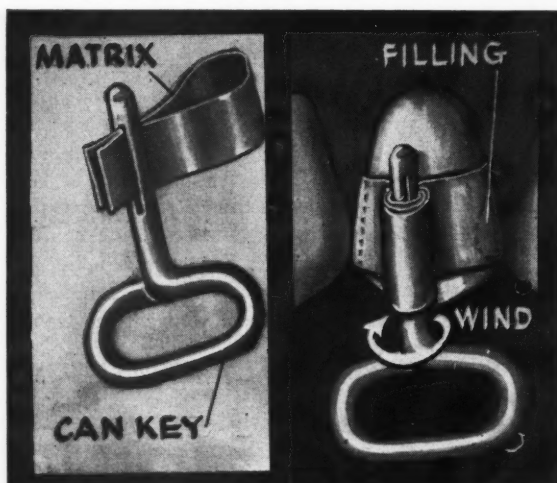


### Treatment of Sensitive Cementum

Harold F. Kedian, D.M.D., Watertown, Mass.

2. Dissolve 100,000 units of penicillin in distilled water and incorporate it in 100 grams of a prepared base (aquaphor). Place the penicillin ointment on the sensitive cervical spot and apply a hot instrument.

3



### A Matrix Retainer for Anterior Acrylic Restorations

Solomon Silver, D.D.S., Bronx, N. Y.

3. Select a slotted key that is used to open a vacuum pack can. Slip the matrix material (either stainless steel or resinous strip) through the slot in the key. Turn the key to apply pressure. The patient may hold the key until the acrylic is processed.

### READERS are Urged to Collect \$10.00

For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay \$10.00 on publication.

You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the



## SUGGESTIONS . . .

### Stabilizing Free Saddles in Partial Dentures

David Schwartz, D.D.S., Brooklyn, N. Y.

4. After the metal frame for a partial denture is fabricated, attach baseplate to cover the edentulous areas. Set the teeth in proper occlusion; then apply a zinc oxide-eugenol wash to the tissue side of the baseplate saddles. Be certain that the clasps and metal frame are in proper position. Do not apply finger pressure over the saddle areas and do not allow the patient to close in occlusion. Finish the saddles in acrylic from this impression.



4

### Locating a Retained Root in an Edentulous Arch

C. W. Pratt, D.D.S., Calumet, Michigan

5. Adapt a baseplate to a cast of the edentulous arch. Cut a window in the baseplate in the approximate area of the retained root. Cover this window with a piece of bronze screen. With the baseplate in position, take an x-ray of the area. By counting the perforations in the grid in comparison with the x-ray the root fragment may be located exactly and the ridge marked for surgical procedure.



5

### A Combined Marking Paste and Surface Anesthetic

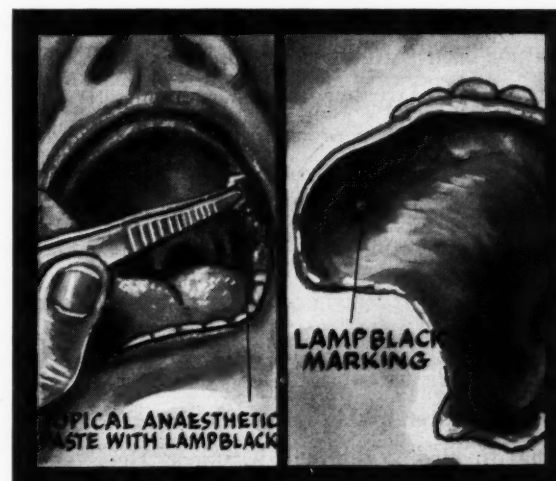
Harry Saxon, D.D.S., Chicago

6. To a few drops of glycerine add sufficient lamp black to make a thick paste. Add benzocaine powder and spatulate thoroughly on a glass slab. The sore area is dried gently and the paste is applied with a burnisher or cotton pellet. The denture is seated and removed immediately. The exact spot will be recorded on the denture. By the time the denture is trimmed, the benzocaine will have relieved the soreness.

The mixture should be kept in a tightly corked vial.

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 42 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.



6

## The EDITOR'S Page

---

WHEN WE uncover the complete phenomena at work in the causation of dental diseases we may expect that derangements in biochemistry will be at the source. The new advances in cellular and histochemistry offer clues, particularly with respect to periodontal pathosis. We may expect, therefore, that the emphasis on prevention and treatment of dental diseases may shift from the mechanical and surgical to the medical. Medical is used in the sense of metabolic, chemical, and biologic rather than with the meaning of specific drug therapy. We are, of course, not yet ready to make this shift in emphasis because of our paucity of knowledge. We will be required to continue to treat the two major dental diseases with mechanical and surgical measures while awaiting the day of greater enlightenment.

It will not be altogether easy for dentists to change their point of view with respect to treatment. We have been too deeply indoctrinated in mechanical methodology to set aside our instruments and place our faith in medical procedures. Nor should we put aside methods that, although empiric, have been used with conspicuous success for many years. Although the riddle of dental caries has not been solved to our complete satisfaction, our methods of treatment have been eminently more successful than the procedures used in the treatment of most other disease conditions. Our treatment of periodontal conditions has not been so successful.

As a foreshadowing of a preparation for a change in emphasis from the mechanical to the biologic there are two significant forces that can be observed: First, an effort at biologic integration is being directed to the dental student. He is being taught the basic biologic sciences with the view of

putting them to work in practice. We were all exposed to the sciences with a sort of tacit understanding that they had no clinical meaning and that they were subjects to be forgotten as soon as the state board requirements had been met. The result was that most of us pursued our clinical ways with scarcely a thought given to biologic integration. The fault lay in the kind of haphazard and casual training that we received in the sciences. All that is being changed. The present dental student is well grounded and is shown in the clinic and the hospital the relationships between the *theories* in pathology, bacteriology, biochemistry, and the *facts* in clinical practice. Tissue—hard, soft, or fluid—has been given a realistic meaning to the present-day dental student.

The second force at work in anticipation of the increasing appreciation of the biologic values in dental practice is the phenomenal interest being shown by practitioners in seminars in oral medicine. Groups in the far West (University of California), the Pacific Northwest, the Middle West (University of Illinois), the East (University of Pennsylvania) have been organized and spend four or five days a year in intense and earnest study on subjects that are not ordinarily offered in dental society programs. Some of the most eminent scientists in the country have appeared before these seminars. The influence is far-reaching. The men who attend these seminars return to their home communities and inspire their colleagues to deeper concentration on fundamental scientific subjects. The next step of opportunity should be the establishment of sustained study club courses in oral medicine that can be made available to practitioners under local dental society auspices.



## Migraine Headache

The distressing migraine headache is responsible for a great deal of suffering in certain people. The persons afflicted with migraine are tense, driving people who are rigid, ambitious, and perfectionists.

These persons have found that doing "more and better than" their fellows brings considerable satisfaction but at great cost in energy. They are considered conscientious and hard working and because of this, more and more responsibility comes their way. Because they delegate responsibility poorly, they become resentful because they cannot keep up with the load which the world and they themselves impose. As a result, tension, fatigue, and exhaustion mount. In this setting headache makes its appearance.

Migraine headache results from widening and stretching of the arteries of the head, chiefly those on the outside of the skull. Many people can momentarily help their headaches by pressing at the site of the pain. Any of the arteries can be affected and produce headaches, but those in the region of the temples are most commonly involved.

Because these headaches may vary from a dull one-sided ache to a pounding prostrating pain involving the entire head, several means to relieve them can be used, depending on the severity. A mild or moderate headache can be relieved by two aspirins and a cup of strong coffee or one or another of the common headache remedies. Narcotics other than codeine should be avoided because of the danger of addiction in the recurrent disorder.

When the pain is severe and the headache cannot be relieved by agents which relieve pain, a drug which narrows the painfully stretched arteries is used. This drug (ergotamine tartrate in doses of 0.25 to 0.5 milligrams given as soon as possible after onset of pain) will usually cause the headache to diminish or

# M E D I C I N E

and the

Biologic

Sciences



disappear within an hour after injection. Unfortunately it cannot be used too frequently without harm. However, it can be given once or twice a week to healthy patients.

It is important for the patient to lie down as soon as possible after the onset of a headache, preferably in a darkened, quiet room. An ice cap to the painful part of the head and a heating pad or hot water bottle to the abdomen or feet are helpful.

It is apparent that the stretching of the arteries of the head is a reaction to the attitudes and points of view that produce worry, fear, tension, resentment, rage, and exhaustion. These are the building-blocks of the common sick headache.

Little more than passing relief can be obtained from medication. The cure must be brought about by the patient himself, guided by the doctor. Cure of the headache really means prevention. In order to accomplish this, habits of living and habits of thinking must be changed.

As a person grows older he becomes more easily tired. One should not expect to do as much at the age of 50 as at 20. Rest and relaxation should be provided in the daily pro-

gram. Often a change from ideal standards and a development of greater tolerance will go far to prevent migraine.

Marcussen, Robert M., and Wolff, Harold G.: *Migraine Headache: What Can Be Done About It?* *Postgrad. Med.* 7:362-363 (May) 1950.

## Breast Feeding

Most clinicians recognize the advantage of breast feeding to both mother and child for the first three to four months. The breast-fed infant exhibits a smoother gastrointestinal performance during the early weeks of life.

If breast milk is adequate in amount, colic and spells of crying because of gastrointestinal discomfort are rare. The breast-fed infant is never truly constipated.

In the first few weeks of life infants may demand eight to twelve feedings per day rather than the six evenly spaced feedings commonly prescribed. The elasticity of feeding supplied by the demand-supply control of the volume of breast milk secreted is something the formula prescriber cannot hope to rival.

The fact of greater safety for the infant provided by breast milk has been proved. Breast-fed infants show a lower incidence of infection than those on formula in outbreaks of diarrhea. Occasionally, breast milk may be contaminated by infection in the breast itself. Therefore, infection of the breast is a contraindication to breast feeding.

The advantages of breast feeding during the first three months of life are largely lost between the third and fourth months. By this time the colic period has passed and gastrointestinal function has become stabilized. The infant can now be fed successfully and adequately on cow's milk formula.

For the mother, the advantages of breast feeding go beyond those of convenience and economy. Breast feeding rounds out and completes the



emotional experience of motherhood.

*Watson, E. H., and Boersma, V. L.: Breast Feeding: Practical Suggestions, American Pract. 1:362-376 (April) 1950.*



### **Gold Therapy for Rheumatoid Arthritis**

In view of the outstanding developments made in the field of rheumatic diseases the value of gold therapy has been questioned to some extent.

Actually, it is difficult to assess the value of any treatment in rheumatoid activity. Rheumatoid arthritis is a disease of protean nature, the course of which varies greatly in different patients. Also, the disease is characterized by remissions and relapses.

In many persons the disease has been much improved but not arrested by gold therapy. Some patients are not helped by gold therapy at all. The majority of authorities in this field consider gold therapy of sufficient value that they have continued to employ it. The manner of action of gold salts is not known. It is thought by some that gold salts probably exert their effects at the tissue level by changing enzyme actions.

Gold salts for arthritis have been flagrantly misused. Gold can be helpful only for rheumatoid arthritis. Inactive disease and the structural damages cannot be altered by a gold compound. Nor can gold correct deformed extremities, free ankylosed joints, or rebuild cartilage and bone. The only value to be expected from gold therapy is that the activity of the disease may be reduced or even arrested. This benefit is of great significance to those who can be helped.

The logical candidates for gold therapy are patients with active rheumatoid arthritis who have little or no articular damage and who are not improving from a good program of therapy employing all other valuable treatment procedures. In the majority of instances, rheumatoid spondylitis is not helped by gold salts. Pa-

tients with rheumatic fever or diffuse erythematosis usually become worse when treated with gold therapy.

The fact that relapses and exacerbations frequently occur after cessation of treatment even though improvement has been of high order is an important consideration in limiting gold therapy. Despite this, discomfort and incapacitation, in fact, all effects of the illness, may be significantly reduced through the course of the disease with the aid of gold salts.

All preparations of gold that may have therapeutic value also have a potential toxicity. The toxicity appears to have an allergic basis. The manifestations of gold intolerance are many and varied. The most common are the cutaneous irritations. With few exceptions, dermatitis, when it occurs, is preceded by pruritis which may be mild or intense, localized or generalized, so that the symptom is the most valuable alarm signal of developing intolerance.

There is no reliable method for determining in which persons toxicity to gold salts will develop. Those administering gold salts should have adequate laboratory facilities so that urine and sedimentation rate can be checked frequently.

Gold salts should be promptly discontinued and corrective measures employed when toxicity becomes apparent. Whether or not toxicity has occurred, gold therapy (after its use has been discontinued) should always be reinstituted with great caution and with small initial doses.

It seems unlikely that heavy metal therapy will be improved. Probably, a different form of treatment will be developed which will replace some current procedures.

It must be emphasized that when gold salts are of benefit the improvement of the patient is not rapid. He should be forewarned that only after several months of gold therapy can he expect to note benefit and that many months may be required before there is sufficient improvement to decrease his disability. Like other forms of treatment, the use of gold salts is not a complete treatment for

rheumatoid arthritis. They are an adjunct to, not a substitute for, good general care.

*Freyberg, R. H.: Present Status of Gold Therapy for Rheumatoid Arthritis, J.A.M.A. 143:418-421 (June 3) 1950.*



### **Procaine**

Procaine hydrochloride is generally accepted as the safest anesthetic for infiltration anesthesia, (A) on the basis of equivalent weights, and (B) on the incidence of reactions in clinical usage. The drug is specifically valuable for tissue infiltration, as in many instances the amount of anesthetic agent required is considerable.

The addition of epinephrine to a procaine solution or any other anesthetic fluid does not have any direct effect in the control of reactions. The action of epinephrine in anesthetic fluids is one of vasoconstriction of the blood supply in the anesthetized area. Thus the rate of absorption of anesthetic by the circulatory system is decreased. This greatly increases the duration of anesthesia in the area.

Reactions from procaine seldom include convulsions or coma. Usually the symptomology consists of (1) nausea, (2) retching or vomiting, (3) fast thready pulse, (4) decreased blood pressure, (5) considerable diaphoresis, and (6) cold, pale skin. The therapy should include oxygen inhalations and the intravenous administration of a vasoconstrictor such as ephedrine in one or two injections of 25 milligrams each. If convulsions occur such barbiturates as pentothal, nembutal or amytal should be administered intravenously in sufficient dosage to control the convulsions. It is imperative that adequate pulmonary ventilation, preferably with a high oxygen content, be maintained.

Prophylactic protection against procaine reactions is obtained with barbiturate premedication. Many reactions occurring with procaine-epine-

phrine solutions are actually not reactions to the procaine but are reactions to epinephrine. The patient feels nervous and highly irritable and may make convulsive movements with gross over-dosage. Nausea and vomiting may accompany this. Other reactions result from an accidental intravenous injection.

As procaine is used for tissue infiltration in concentrations between 0.5 and 2 per cent, it is possible that as small amount as 5 cubic centimeters might prove fatal if given intravenously.

Intravenous procaine has become a valuable clinical tool. With the patient under general anesthesia 1 per cent procaine solution given intravenously will not be harmful in judicious amounts. In the unanesthetized patient the concentration of procaine for intravenous use must be reduced to 0.1 or 0.2 per cent. The solution must be administered slowly to avoid reactions.

Reactions to procaine will increase in frequency with increased dosage. For an adult the maximum dosage is 1 gram of procaine. This is equivalent to 50 cubic centimeters of a 2 per cent solution or 100 cubic centimeters of a 1 per cent solution. This maximum dosage is lowered in pediatric or geriatric practice or in debility.

*From Queries and Minor Notes; Procaine, J.A.M.A. 142:1937 (April 29) 1950.*

### **Diabetes—Basic Considerations**

Much attention is being given to the detection of the patient with unrecognized diabetes. Caution must be exercised not to be too hasty in giving a diagnosis of diabetes.

A single positive urine test does not mean diabetes, nor does a single negative test exclude it. An accurate diagnosis cannot be made without both urine and blood studies. Even then there are many cases in which the diagnosis may remain in doubt.

Generally speaking, the most common diagnostic procedure is to give

100 grams of glucose after a fast of at least twelve hours and after a period of three days during which there has been no restriction of ordinary diet. Urine and blood tests are made before the glucose is ingested and at various intervals thereafter, usually at periods of one, two, and three hours. In the normal person, it is expected that (1) the blood sugar will not rise above 180 milligrams per 100 cubic centimeters, and (2) the level will return to normal two or three hours after the glucose meal is given. Most observers agree that a peak value, even though accompanied by glycosuria, is not diagnostic of diabetes if the blood sugar returns to normal in two hours.

The object of diabetes management is to keep all patients at work without interruption (1) because of episodes of hypoglycemia or severe acidosis, and (2) without serious late vascular complications as evidenced by retinal changes, heart and kidney damage, and peripheral vascular disease.

The whole subject of diabetes control may be briefly summarized as follows: In the newly discovered case it is probably desirable to treat the patient vigorously, that is, to try to keep both urine and blood sugar normal in the hope that rapid actual pancreatic regeneration may result.

Once it has been determined that there is no hope for rapid pancreatic regeneration or once it is clear that the patient needs 30 or more units of insulin, vigorous treatment may not be necessary or practicable. A conservative attitude may be advisable. The problem is to keep the diabetes in as good control as possible.

Education of the patient is of great value. In general, the diet does not differ greatly from the average diet. The fat is definitely reduced and the protein is high.

Insulin is a potent drug. It should be started slowly and changes in dosage should be made gradually. The presence of acidosis is a definite danger signal requiring vigorous treatment for at least a brief period. In every case careful attention should be directed to the state of the peripheral circulation and to the patient's general physical condition.

*Ohler, W. Richard: Diabetes. Certain Basic Considerations, New England J. Med. 242:245-250 (February 16) 1950.*



### **Increase of Tuberculosis**

An apparent increase of tuberculosis has been reported to official agencies in recent months. Probably the greatest factor in this apparent increase arises from the diagnoses made from shadows alone in the mass roentgen ray surveys.

During and since the war, millions of civilians have had roentgenographic inspections of the chest; there were about 14 million in 1949 alone. Authorities advise against diagnoses being made from roentgen shadows alone. However, the practice continues in many places.

On the other hand, there has been a real increase in tuberculosis in the United States as a result of World War II. During and since the war several million persons in the military services were sent abroad. Many of them were in areas where large numbers of cases of contagious tuberculosis existed among the citizenry. Hence, infections and reinfections with tubercle bacilli occurred.

From evidence available it seems probable that primary tuberculosis developed in several hundred thousand persons while abroad. Each of these brought back lesions containing virulent tubercle bacilli. These persons are now widely scattered throughout the country.

Insufficient time has elapsed for many lesions to mature to fatal termination. Therefore the increase in tuberculosis as a result of war is not yet noticeably reflected in mortality rates. There already is and will continue to be an increase in the incidence of clinical tuberculosis in this country as a direct result of the war. Many who were infected before the war were exogenously reinfected after induction in their various sojourns outside this country.

Another real increase in tuberculosis in the United States has its source

among displaced persons from the countries where nearly all adults have primary tuberculous lesions and hence are reactors. With several hundred thousands of such persons being admitted, tremendous numbers of tubercle bacilli are brought with them. Among these persons one must expect a constant supply of cases of clinical tuberculosis.

It is highly important in this country for some time to come that the following conditions be observed: (1) All those who have returned, (2) those who will later return from military service abroad, (3) all displaced persons here now, and (4) those who subsequently enter, should be tested with tuberculin and the reactors carefully examined periodically. Roent-

gen inspection of the chest should be made at least once every six months. If this is not done the increase in tuberculosis in the United States may become enormous within the next ten or fifteen years.

*Editorial: Increase of Tuberculosis—Apparent or Real, J.A.M.A. 143:556-559 (June 10) 1950.*

## Registration of the Denture Space

ROBERT R. GILLIS, D.D.S., Hammond, Indiana

IT HAS BEEN established that (1) head posture and mandibular posture are essential basic data, (2) maxillomandibular relation in the individual patient at rest (muscular equilibrium) remains constant throughout life, and (3) mandibular functions depend upon musculature and not primarily upon teeth or tooth positions, but tooth arrangement must conform to anatomic and physiologic environment.

### Former Restorative Procedures Based On Mechanical Concepts

In the past, dentists have erred in trying to establish jaw relations by techniques that employed the patient's voluntary effort to shut, close, or bite on interposed wax, often in unnatural head poses and with manual assistance by the dentist. In this way muscular equilibrium in the head and neck was disturbed or prevented.

### Technique

For the technique described, the patient must be posed erect, sitting as though in function at his dining-table. He must be kept ignorant of the objectives of the procedure.

*Functions of the Mandible*—The four S's, Speech, Smiling, Sucking, and Swallowing activate the masticatory muscles to produce the required mandibular movements (1) in paths exactly parallel with masticatory movements, and (2) with the added advantage that these movements are performed as a matter of habit so that the patient will demon-

strate them without the degree of voluntary effort which creates the errors accompanying the close-shut-bite response in about 80 per cent of cases.

*Freeway Space*—In muscular equilibrium, the mandible is posed at its rest position. Normally, the upper and lower teeth are apart from each other about 2 millimeters to 5 millimeters. This interocclusal space is essential to patient comfort and efficiency. An occlusion should never encroach on freeway space.

*Speech*—Employment of a few sounds associated with certain letters of the alphabet will demonstrate some of the mandibular paths:

(1) Say M. Note that the mandible rises from rest position and returns to rest position (1) constituting rest relation to the maxilla, and (2) determining rest vertical dimension.

(2) Say M-Ah, M-Ah. Note that the mandible first rises above and then falls below rest position.

(3) Say M-O, M-O. Note that the mandible first rises on M, falls below rest position on O, then returns to rest position.

(4) Say M-U, M-U. Note the protrusive travel on U.

(5) Say C-Z, C-Z. A slight occluding of the teeth may possibly be detected in the cuspid-lateral region. The sounds S, C, Z produce near-occlusion but not centric occlusion.

(6) Say F, If, Five. Note that the lower lip seals lightly against the edges of the upper incisors, the teeth contacting just inside the maximum contour of the lip. F and V sounds provide an excellent guide for place-

ment of upper denture anterior teeth, both vertically and anteroposteriorly, and determine the labioincisal edge of the occlusal rim earlier.

After every speech movement the tongue, lips, and mandible return to rest position in muscular equilibrium. Make several measurements to determine the patient's rest vertical dimension.

*Smiling*—Pouting produces a protrusive movement while smiling produces retrusive movement just slightly off from rest position. No speech or smiling function should produce occlusion between the upper and lower teeth; in such movements, the mandible carries the lower teeth only part way across the freeway space.

*Swallowing*—Say M-M, then smile and swallow. Note that the teeth went into momentary occlusion while swallowing.

*Analysis of Swallowing Function:* (1) The lips closed gently, (2) the teeth occluded, (3) slight sucking created a partial vacuum in the mouth, (4) the tongue actually filled the space within the denture space, and (5) the tongue curled upward and backward and tossed saliva (or drink or bolus of food) down the hatch.

*Swallow to Occlusion:* Swallow to occlusion and suck hard; note how the peripheral muscles draw against the teeth and the tongue presses the linguogingival borders. This is an excellent determinant to use in making a closed-mouth impression that definitely delineates the denture's periphery in function.

*To Differentiate Between Functional and Centric Occlusion:* 1. Swallow and hold the occlusion. 2. Release a little and chatter the teeth together to feel whether the hit is equal and sim-



ultaneous on right and left sides. 3. If an unequal contacting is felt, slightly premature on one side, a hit and slide effect, even if slight, there is a bump in the road along the closure path from rest position to centric occlusion. 4. Many denture and bridge patients have interference in the closure path which should be eliminated so that functional occlusion may coincide with centric occlusion.

### Comments

1. By observance of the patient's normal functioning in paths parallel to, and by the same and associated muscles as in mastication, physiologic guidance can be substituted for mechanical guidance.

2. The danger of voluntary overdoing by the patient in his eagerness to cooperate, will be virtually eliminated.

3. Having once determined rest position (and its measured rest-vertical-dimension) freeway space and occluso-vertical-dimension can readily be determined.

4. Remember that rest-vertical-dimension minus freeway space equals occluso-vertical-dimension.

### Tests for a Correct Denture Space Registration

The accuracy or correctness of denture space findings as indicated by bite-blocks or occlusion rims constructed and thought to be satisfactory, can be tested before proceeding with further stages of construction:

1. With bite-blocks in function in the mouth examine the freeway space when the mandible is at rest position to see that the freeway space meets expectations. *Freeway space may exceed the anticipated figure more safely than be smaller than anticipated.*

2. Examine with speech tests to be sure there is no occlusion during speech.

3. Show a proper lower-lip-upper-incisal contact on pronouncing F and V.

4. Show near-occlusion anteriorly on sounding S, C, Z.

5. Bilateral simultaneous occlusion must occur when swallowing.

(Continued on page 40)



**FACING GRAND CIRCUS PARK**

First thing to do in Detroit is check in at Hotel Tuller! You'll enjoy every minute. Newly modernized. Beautifully decorated. Within walking distance of all downtown stores, theatres and business activities . . . yet, you enjoy the ever-green atmosphere of Grand Circus Park . . . The Tuller Coffee Shop or Cafeteria for excellent food modestly priced.

**COCKTAIL LOUNGE**  
ONE OF DETROIT'S FINEST

**800 ROOMS \$2<sup>75</sup>**  
WITH BATH FROM  
**Hotel Tuller**  
Harry E. Paulsen, Mgr.

**DETROIT'S "FIRST"**  
IN  
**CONVENIENCE · COMFORT · QUALITY**

## BUY SECURITY BONDS



Many generations of leading Dentists have insisted on Ames Cements

**THE W. V-B. AMES CO.**  
FREMONT OHIO

### Others Have Tried BS POLISHERS Why Not You?

Many dentists have sent in the coupon below and found out why BS Polishers are preferred over many others. They can readily understand why this soft, flexible rubber polisher makes a patient feel safe and comfortable, also why it is easy for it to clean and polish every tooth to a lustre brightness. Why don't you find out these facts for yourself? Send the coupon in now!



Young Dental Mfg. Co.  
St. Louis 8, Mo.

Gentlemen:

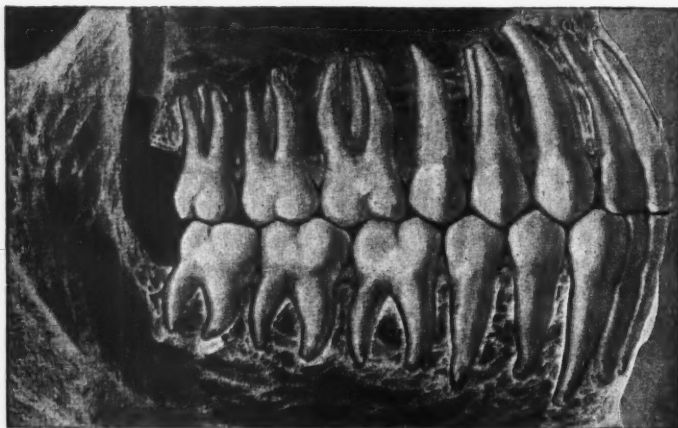
Without any obligation send us one of your BS POLISHERS—ABSOLUTELY FREE.

NAME .....

ADDRESS .....

CITY .....

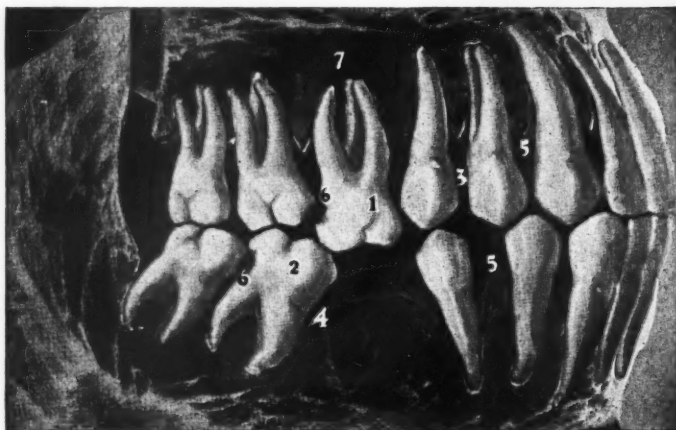
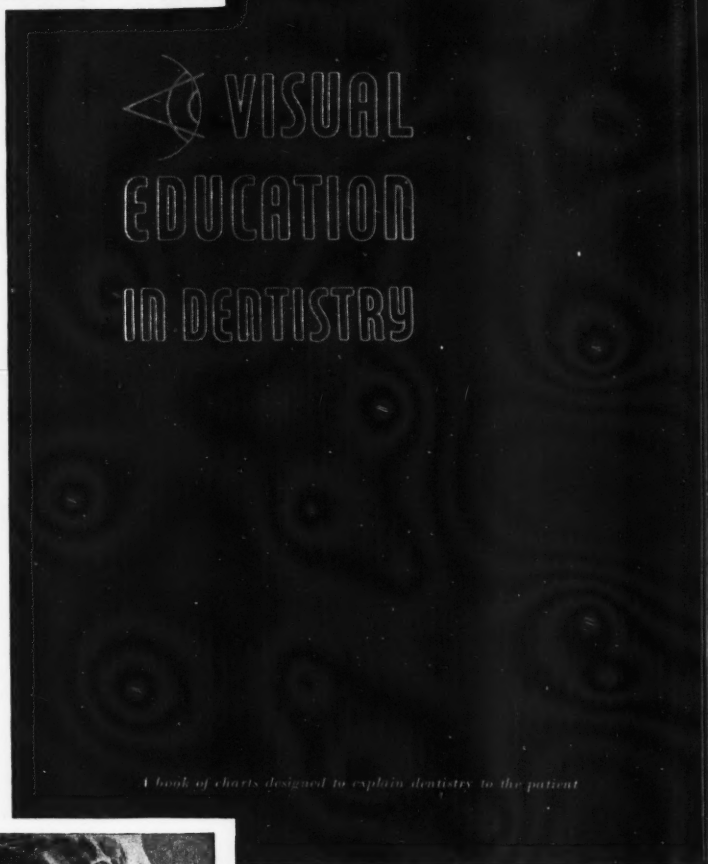
STATE .....



This illustration shows normal conditions: teeth in proper alignment and contact; gum and bone tissue normal.

# WHY CONSTRUCT A BRIDGE?

*... one of the  
31 charts in  
this booklet  
which thousands  
of dentists  
are using ...*



This illustration shows the pernicious results in the entire mouth that follow the loss of a tooth with failure to construct a bridge.

**PREVENTION:** Construct a bridge for every tooth that is lost.

(This quotation is taken from a recent letter)

"I have received my copy of Visual Education in Dentistry with my subscription to Dental Digest. I find that this book of charts affords a wonderful opportunity to explain dentistry to the patient, and I therefore am requesting another copy of Visual Education."

The above *voluntary* comment is typical of letters we receive almost every day. It typifies the manner in which *Visual Education In Dentistry* is received in countless thousands of dental offices. Its terse "wonderful opportunity to explain dentistry to the patient" is the chief reason for this series of 31 charts which is now in its tenth reprinting. And this

### CONTENTS

- |  |   |
|--|---|
| 1. Dental Conditions                               | 17. The Foundation's the Thing                  |
| 2. Development and Eruption of Teeth               | 18. Insulation                                  |
| 3. The Progress of Tooth Decay                     | 19. "One Rotten Apple May Spoil a Bushel"       |
| 4. Why Construct a Bridge?                         | 20. The Circulation of The Blood                |
| 5. How Irregularities of the Teeth Affect the Face | 21. Pyorrhea Treated or Neglected               |
| 6. Modern Porcelain Restorations                   | 22. The Action of Local Anesthesia              |
| 7. The Expense of Poor Dentistry                   | 23. "A Little Neglect May Breed Mischief . . ." |
| 8. The Development of Root-End Infections          | 24. The Fifth Cranial or Trigeminal Nerve       |
| 9. A Stitch in Time Saves Nine                     | 25. Danger Begins at Six                        |
| 10. When the Dentist Fills the Tooth               | 26. How a Full Denture Fits                     |
| 11. "Things Are Not Always What They Seem . . ."   | 27. How the Loss of Teeth Affects the Face      |
| 12. The Development of Jaws and Teeth              | 28. The Dangers from the Impacted Tooth         |
| 13. Diseases of Teeth and Trees                    | 29. What Does the X-RAY Show?                   |
| 14. The Collapsed Face                             | 30. The Requirements of a Correct Restoration   |
| 15. The Dangers from Pyorrhea                      | 31. Development of the Skull                    |
| 16. "Be Not the Last to Lay the Old Aside . . ."   |   |

practitioner's request for a second copy is the rule rather than the exception—one copy for use in the operatory and one copy for the reception room.

The present reprinting of *Visual Education In Dentistry* is identical with the previous edition with one exception—a new four-page two color chart entitled **THE DANGERS OF PYORRHEA AND POSSIBLE COMPLICATIONS**. It portrays possible complications in the blood stream which could stem from a pyorrhetic condition. Patients can readily assimilate this type of presentation. This is only one of the 31 charts in the complete booklet (see titles of the other 30 charts in the box on the left).

The chart **WHY CONSTRUCT A BRIDGE?** (see miniature reproduction on opposite page) is in constant use in dental offices everywhere. Many practitioners have it framed for easier use and preservation.

Twenty of the charts are printed in *full color*; 8 are printed in two colors. Only 3 are in black and white. All can be used effectively in educating the layman to understand the value of periodic dental care and the dangers of neglect. Isn't this an important problem in your practice?

The old bugaboo, fear of pain, is *slowly but surely* being overcome in the mind of the layman. And the regular use of the charts in *Visual Education In Dentistry* can help make this problem an easier one for you and the patient. The potential good will and better health cannot be overestimated.

The original edition of *Visual Education In Dentistry* contained only 12 charts and sold for \$1.00 to regular subscribers and \$2.00 to non-subscribers. The latest reprinting (31 charts) sells at the same prices despite terrific paper and printing increases over the years. We have always taken the attitude that the profit motive isn't the important factor in the dissemination of material of this highly ethical type.

Why not order one or more copies at this time? The coupon is for your convenience. All orders receive prompt attention. We refer non-subscribers to Dental Digest to the special combination subscription offer shown in the coupon.

DENTAL DIGEST, 1005 Liberty Ave., Pittsburgh 22, Pa.

☐ I am a subscriber to DENTAL DIGEST. Please enter my order for 1 ☐ copy; 2 ☐ copies of the latest reprinting of "Visual Education in Dentistry." My remittance at the rate of \$1.00 per copy is enclosed herewith.

☐ I am not a subscriber. Please enter my name on the subscription list for 16 issues of DENTAL DIGEST (September 1950 to December 1951) and one copy

of "Visual Education in Dentistry" for \$5.00. My remittance is herewith.

Dr. ....

Address .....

Dealer .....

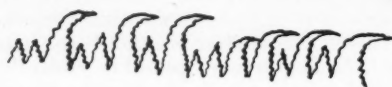


## MAKING MAGIC OUT OF MOUNTAINS!



### **SAD**

Greatly magnified view of surface of case, as cast, shows mountains like this . . .



### **SMEARED**

Mechanical polishing smears the surface like this . . .



### **SMOOTHED**

TI-LECTRO polishing cleans the surface and gets greater reflectivity by smoothing the peaks.

Result: Cases have new, lasting brilliance, better fit.



Look FIRST to:

## **TICONIUM**

413 N. Pearl St.  
Albany 1, N. Y.

TICONIUM - 413 N. PEARL ST., ALBANY 1, N. Y.

I WOULD LIKE A TI-LECTRO "NEW" FOLDER  
WHICH TELLS ALL ABOUT TI-LECTRO POLISHING.

DR. \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

(Continued from page 37)

6. Constancy (1) of anteroposterior relation between upper and lower blocks at occlusion, and (2) of continuity of median line markings at occlusion must exist. At rest position a break in such continuity is not indicative of error.

### **Conclusion**

1. Driving your car over a stone on the pavement is like malocclusion; it means tire danger and car shock.

Malocclusion in the mouth is chewing away the support of teeth or dentures. With the method of detection described, destructive malocclusion can be eliminated and functional occlusion can be made to coincide with centric occlusion.

2. This method of determining the denture space makes it possible to construct bridges or dentures in harmony with the patient's natural pattern of mandibular relations and movements.

3. Finally: Never build occlusion-vertical-dimension that encroaches on freeway space. Be generous rather than stingy with freeway space.

Adapted from *Journal of the Indiana State Dental Association* 29:2-4 (July) 1950, and originally presented over the University of Illinois, College of Dentistry Long Distance Telephone Extension Program.

## **Contra- Angles**



### **The Case of Mrs. H**

This is the story of Mrs. H and her severe periodontal disease. In this history there are many fine shadings of the principles of psychosomatic medicine. No clinician who would encounter Mrs. H would arrive at any diagnosis except to tell her that she needs a full mouth extraction. There is marked bone destruction, there is suppuration, there is extensive tooth migration. She is beyond the skill of the conservatives with their scalars and curettes; beyond the skill of the surgeons with their scalpels and electrocautery; beyond the skill of the oral engineers and their methods of occlusal equilibration. Mrs. H has been told by three dentists in words of brutal frankness that she should lose all of her teeth, but she resists and will not accept the proper treatment. Her intelligence dictates that she should accept the treatment, but her emotions rebel. This is an unusual case only in the degree of rebellion. She flatly refuses the treatment that is indicated and seeks solace and comfort and understanding. I would like to know how Mrs. H should be managed because I have recently seen her as a patient.

She is a widow with three children. As she mournfully expresses it, "and I am only forty-two." Her husband died suddenly and she protests her loss "and why should this happen to

me?" I do not propose that her severe periodontal disease is the result of the emotional upheaval associated with her widowhood but I am not at all sure that such an emotional stress may not be a contributing factor. We know that the finely adjusted body chemistry, homeostasis, may be thrown out of balance by environmental forces and the stresses and strains under which people live. Some forms of hypertension, asthma, peptic ulcer, coronary disease, arthritis, have been shown to originate in the thoughts, feelings, and attitudes that people harbor. Not all disease is due to bacteria or mechanical trauma and I presume that this principle holds for periodontal as well as for all other forms of disease. McCartney states the case: "There is a preponderance of scientific evidence which proves that not only can physiologic function be altered, but actual lesions of tissue can be brought about by psychically produced impulses, but to cause anatomic damage, these impulses must be intense and long sustained."

I wish to add no further confusion to the field of periodontia, but I think it time that we stop and evaluate the person who has the disease as well as the disease that has the person. Up to this time, we have been almost exclusively concerned with the minutiae of the disease process, the histopathology and the clinical manifestations, and concerned but little with the total person that has the disease. Possibly in an evaluation of the life situation and the personality structure of the patient, we may uncover important etiologic facts and better methods of treatment.

As a brief aside, I should like to report a symposium that I recently attended on periodontia. Four distinguished periodontists comprised the panel. Although they were supposedly speaking on the same subject, they were in almost total disagreement. The first speaker, a college professor of the conservative school, said that periodontal disease could be managed by cleanliness, oxygen therapy, and stimulation. The second speaker, a surgeon, made it plain that only by surgical reduction

*Accepted!*

## OPOTOW MANDIBULAR AND PERIPHERAL (M&P) PASTE

SPECIFICALLY DESIGNED FOR FULL LOWER IMPRESSIONS and PERIPHERAL BORDERS



OBTAINABLE at ALL DENTAL DEPOTS

*Sole Distributors*  
**INTERSTATE DENTAL CO., INC.**  
 NEW YORK 18, NEW YORK

of the pocket to the bone line, might periodontal disease be successfully treated. And as a parenthetical note he pronounced with unbelievable emphasis that periodontal disease was not to be considered as a focus of general infection. The third speaker recognized systemic relationships and realized that disease processes and the reactions to treatment differed widely among persons. The fourth speaker, a member of the oral dynamic-engineering school of thought, believed that most of the periodontal problems sprang from perversions in

mechanics, notably from the constant expansion of the upper arch. I feel guilty to add to this confusion by suggesting a possible psychogenic factor in the causation and complication of certain cases of periodontal disease.

To my knowledge, no clearer statement concerning the tenets of psychosomatics has been made, than that by McCartney: "To try and single out certain diseases as psychosomatic is futile, as every disease is essentially psychosomatic, because both psychologic and somatic factors have a

## CLINICAL AND LABORATORY SUGGESTIONS

(See pages 30 and 31)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor

DENTAL DIGEST  
708 Church Street  
Evanston, Illinois

From: \_\_\_\_\_

Subject: \_\_\_\_\_

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.

\$10 will be paid on publication for each suggestion that is used.

part in its cause and influence its course. Thus, even though a disease may appear to be restricted to a physical disorder, such as tuberculosis, appendicitis, or myocarditis, even these illnesses might be considered to have a mental component. The degree of mental and nervous reaction will depend on the basic personality of the patient as well as other factors, including the seriousness of the illness, the degree of suffering, uncertainty regarding the outcome, interference with work and other plans, and financial loss." Obviously, therefore, we cannot treat any disease successfully without knowing the basic personality of the patient. Dental diseases are no exception.

### A Cordial Welcome

March, 1951, will see the publication of the first number of the *Journal of Prosthetic Dentistry*. This will be the official journal of three substantial societies: The Academy of Denture Prosthetics, The American Denture Society, and The Pacific Coast Society of Prosthodontists. The publisher, The C. V. Mosby Company of St. Louis, has a long and honorable experience in the dental field. The editor, Carl O. Boucher of Ohio State University, heads a distinguished group of American dentists that includes the associate editors, the editorial council, and the contributing editors. It is inconceivable that anyone could put together a more intelligent and better group to direct a dental publication.

The *Journal of Prosthetic Dentistry* will be published six times a year under the following editorial policy: "Subject matter in the Journal will be chosen according to its interest and value to those concerned with any and all phases of prosthetic restorations. Complete denture prosthesis and partial denture prosthesis will be treated from every angle. Fundamental sciences and research related to prosthetics, diagnosis, theory and practice, laboratory procedures, dental materials, and evaluation of methods and procedures will all have their fair share of space and attention.

"Worthwhile articles on special



prosthetic problems such as cleft palate restorations, speech appliances, facial prosthesis, and related problems will be given a prominent place in the Journal.

"This Journal is designed to bring to its readers the advancements in prosthodontia of technical and practical nature; to present both sides of controversial issues; to stimulate creative thinking on problems facing the prosthetist, and to provide a challenging medium to the many potential contributors to this field of scientific literature."

Any journal published under such an enlightened and enterprising policy will be an important addition to the dental periodic literature. To be assured of a complete volume of *The Journal of Prosthetic Dentistry*, subscriptions should be sent immediately to The C. V. Mosby Company, 3207 Washington Boulevard, St. Louis 3, Missouri. The subscription price is \$9.00 a year for subscribers in the United States.

#### A New Look in Advertising

If your child doesn't have a television set he is headed for a neurosis, a feeling of rejection and insecurity, and generally a hell of a conflict in his poor little psyche. So said the American Television Dealers and Manufacturers in full page advertisements in metropolitan newspapers. Some copywriter got hold of a book on child psychology and a naive statement from the child guidance authority, Mr. Angelo Patri. With these two building blocks he put together a piece of scare copy under the heading, "There are Some Things a Son or Daughter *Won't* Tell You."

Most parents, when they saw that heading, leaped to the bait hoping to understand Junior or Sister a little better. What they got was a bunch of words with bludgeoning scare appeal ("dramatic impact," as the agency men in conference assembled would describe them) intended to sell television sets. The reaction was exactly the reverse. The copy backfired in the faces of the television set makers. Parents got so mad that the television makers promised that the copy would not be used again and poor Mr.

Angelo Patri returned the check he received for his testimonial.

Stubbornness—or strength of character, when we describe the trait in ourselves — is a powerful force to overcome. Get people mad enough to say "Nobody can browbeat me into buying a television set" and a sales resistance will be built up that will be hard to overcome. People hate to be forced or blackjacked into anything, particularly by appeals to fear or

questions concerning the adequacy of their parenthood.

Television has a place. According to my score, about 20 per cent of the programs are good. The other 80 per cent are "corn" in varying degrees, mostly ripe. Television cannot be considered as substitute for outdoor activity, group projects, reading, or companionship among children. "Sunshine for his morale, vitamins for his mind" by way of the television

# JUSTI *Announces the*

## NEW & IMPROVED DENTA PEARL CROWN & BRIDGE FORMULA

... and the  
discontinuation  
of ACRYNAMES\*

- **NEW SHADES** give greater shade range.
- **IMPROVED FORMULA** provides wear-resistant restorations without a "finishing problem."
- **BUILT-IN FLUORESCENCE** creates natural vitality.
- **PREMIXED SHADES** match the Denta Pearl guide to save your time.



**14 POPULAR SHADES** — The more than three years of popular demand, and the thousands of satisfactory restorations being worn, prove the 10 Denta Pearl AGE-FREQUENCY shades adequate for most any case. However, for the anomalies that occur in natural teeth that require a shade with a decided gray hue, the following four new shades have been incorporated in the Denta Pearl kit:

**65 — 66 — 67 — 69**

\* **LIBERAL TRADE-IN ON OLD ACRYNAMES POWDERS.**  
For a limited time only, your Dealer will give a generous trade-in on old Acryname outfits. This offer expires March 15, 1951. After this date, no trade-ins or exchanges on Acryname will be accepted.

# JUSTI

*Products for Better Dentistry*

H. D. JUSTI & SON, INC. • PHILADELPHIA 4, PA.

## In your ORAL HYGIENE this month



### When Are Fees Excessive?

"Instead of fixing fees haphazardly by the local hearsay market, or what we believe the patient can afford to pay, we should adjust our fees to a schedule based on the *work-hour*," says Doctor William Roy Eberle in an article urging dentists to use sound business methods in determining fees—and explaining such a method. Doctor Eberle also warns that "the fee question is a dominant factor in the growing menace of socialized dentistry."

★ ★ ★

"What Do You Care About Dental Educators?"—Doctor John H. Mos-teller cared enough to gather material for a most interesting article explaining the plight of the dental educator and suggesting to the profession that action be taken toward a more just and equitable salary scale for dental educators. Today, the men who teach in our dental colleges are making a real sacrifice financially in order to train the dentists of tomorrow.

★ ★ ★

"I'd Like Some Social Security," insists Doctor Sherman Holling, in reply to Doctor R. B. Moore's recent article, "Do Dentists Want Social Security?" He explains:

"The whole matter of retirement plans for dentists should be opened for discussion within the profession. Maybe there are good reasons why dentists as essential producers and taxpayers should not be eligible to

enroll as self-employed persons under Social Security, but if there are such arguments I have never heard them. A lot of sentiment has been expressed and there has been a lot of palaver about the independence and rugged individualism of the professional man. At times these sentiments have not squared with the facts of poverty observable in the lives of some professional men when they reach old age."

★ ★ ★

Those young "Hopalong Cassidy's" that carry their guns into your reception room might have new respect for your profession if you told them the tale of "Doc" Holliday—a dentist who was one of the outlaws of the old west, and who worked *with* the law almost as often as *against* it. The true story is related by David Deutsch.

★ ★ ★

"Let's Write Prescriptions," suggests Doctor Paul B. Bass, as he explains that the procedure is simple but that "We have so filled our time and our minds with technical procedures that we seem to have forgotten the elementary knowledge required to order medicines for our patients." His article is a short refresher in prescription writing. You may want to clip this for your files.

★ ★ ★

All of the regular departments and features, too, of course.

set is colossal bunk. Children should roam and play for their morale and their vitamins. To coop them up in a darkened room will not help their health a bit and their morale and mind but little. If people want to buy a television set they should get one for its entertainment value and not as a tonic for soul and psyche.

It is encouraging when people arise in their indignation and slap down a piece of hokum such as that put out by the television manufacturers. Other advertisers should catch on and begin to train their copy to more sensible qualitative proportions. There have been too many superlatives spent describing products and too little energy spent improving products. People are building up a fine resistance and immunity to advertising bunk — more strength to them.

### Speaking of Urine

The latest advice directed to dentists comes from the dental division of a State Health Department advising dentists to "examine the urine of their patients or demand a recent report." It is admirable to enlist the interest of dentists to detect diabetes but to turn the dental office into a urine collection station is carrying things too far. For that matter "demanding a recent report" on the affairs of the urine is a bit extreme for the dentist.

Diabetes is a grave disease. The diabetic patient frequently has oral manifestations of the disease and he is certainly a poor surgical risk. The dentist should be alert to these conditions but his alertness should consist in referring the patient to his physician. There is probably no legal reason why a dentist should not include a urinalysis in an appraisal of a patient. No court would likely find him guilty of malpractice or practicing medicine without a license if he could show possible relationships between dental disease and diabetes. These relationship could be easily demonstrated. There are, however, other than legal reasons why a dentist should stay out of the urine evaluating field. It is an intrusion into the field of the physician. The dentist screams on high if a physi-

cian passes an opinion or makes a dental diagnosis, and rightly so. Urinalysis, either in the test tube or by demanding a recent report, is an invasion of privacy. We have our hands full bathed in the fluid of the mouth without looking afield for any other fluids to conquer — if you will pardon the mixed metaphor.

—E. J. R.

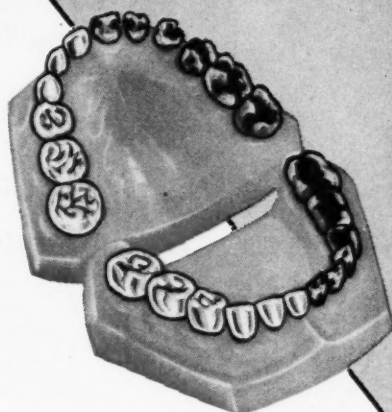
## Advertising Index

Ames Co., the W. V-B .....	37
Bristol-Myers Co. ....	1
Castle Co., Wilmot .....	47
Columbus Dental Mfg. Co. ....	8
Continental Chemical Co. ....	48
Cook-Waite Laboratories, Inc. ....	5
Dental Perfection Co. ....	48
Dentists' Supply Co., The 4th Cover	
Hanau Engineering Co., Inc. ....	48
Interstate Dental Co. ....	41
Justi & Son, Inc., H.D. ....	43
Lavoris Co. ....	46
Luxene .....	4
Mosby Co., C. V. ....	6
Pfizer & Co., Inc., Chas. ....	7
Rocky Mountain Metal Products	45
Lee Smith & Son Mfg. Co., Lee S. ....	4
Ticonium .....	40
Tuller Hotel .....	37
Universal Dental Co. ....	2nd Cover
Vernon-Benshoff Co. ....	3rd Cover
White Dental Mfg. Co., The S. S. ....	3
Williams Gold Refining Co. ....	2
Wilmot Castle Co. ....	47
Young Dental Mfg. Co. ....	37

## FULL OCCLUSAL HEIGHT *in*

### Permanent Restorations of Children's Badly Decayed Teeth

Ductility for a perfect fit  
Tenacity to hold fast  
Durability to stand a child's habits  
Applied in one chair time  
Will not tarnish  
Tissue-tolerant  
53 units insure accurate fit  
Fewer exposures and abscesses  
Lower cost but better results



● Because they are made of Tru-Chrome, Tru-Form Deciduous Crowns are strong enough to resist any hard substance a child may try to bite. Thus it is possible to restore perfect occlusion in any normal case. The operating technics are fast and simple. Failures so common in older methods of treatment are largely eliminated with these Crowns. There are sizes and shapes for all deciduous teeth and first permanent molars.

Crowns, 30c apiece. Introductory assortment of 100 in permanent plastic box, 30.00. Box alone, \$1.50. Space Maintainers, 75c dozen (6 sizes).

**Please Order From Your Dealer**

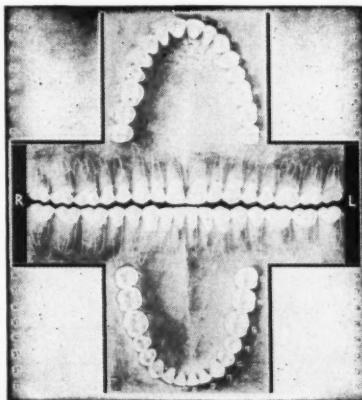
*Free on Request:* Folder describing the restoration and space maintaining technics, with chart of sizes.



**TRU CHROME**  
**ROCKY MOUNTAIN METAL PRODUCTS CO.**

P. O. BOX 1887

DENVER 1, COLO.



### Permanent Records Are Important . . .

Do you have a permanent record of the mouth of each of your patients? This type of record is tremendously important, and easy to accomplish. Use the Ryan Treatment and Examination Chart as illustrated here. It is being widely used and is acclaimed the most practical chart for record purposes. Use it on *one case . . .* and you will want to use it on *every case*. The coupon is for your convenience.

Dental Digest  
1005 Liberty Ave., Pittsburgh 22, Pa.

Here is \$1.00 for a pad of 50 Ryan Examination and Treatment Record Charts.

Dr. ....  
Address ....  
City .....



# LAVORIS

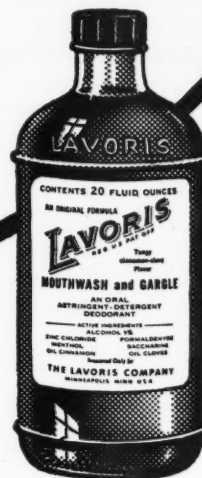
REG. U.S. PAT. OFF.

MOUTHWASH AND GARGLE

*You'll be delighted...*  
**HOW CLEAN AND FRESH  
 YOUR MOUTH FEELS**  
*Try it!*



Tangy  
 Cinnamon-clove  
 Flavor



DETACHES AND REMOVES GERM HARBORING FILM

**THREE SIZES—AT ALL DRUG STORES**

See second cover

D.D.1

UNIVERSAL DENTAL CO.  
 48TH AT BROWN ST., PHILADELPHIA 39, PA.

Please send information concerning the  
 Five-Phase co-ordinate size system.

Dr. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

See page 2

D.D.1

WILLIAMS GOLD REFINING CO., INC.  
 (DEPT. 4) 2978 MAIN ST., BUFFALO, N.Y.

Please send FREE, the Plastic Pattern  
 Accessories and Technics, as advertised.

Dr. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

See page 3

D.D.1

THE S. S. WHITE DENTAL MFG. CO.  
 211 S. 12TH ST., PHILADELPHIA 5, PA.

Please send information concerning your  
 products.

Dr. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

See page 4

D.D.1

LUXENE, INC.  
 118 EAST 25TH ST., NEW YORK, N.Y.

Please send information concerning  
 LUXENE 44.

Dr. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

See page 5

D.D.1

COOK-WAITE LABORATORIES  
 1450 BROADWAY, NEW YORK, N.Y.

Please send us information on Novocain-  
 Pontocaine-Cobefrin.

Dr. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

See page 6

D.D.1

THE C. V. MOSBY CO.  
 3207 WASHINGTON BLVD., ST. LOUIS 3, MO.

Please send information on book adver-  
 tised.

Dr. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

See page 7

D.D.1

CHAS. PFIZER & CO., INC.  
 BROOKLYN 6, N.Y.

Will welcome detailed information on  
 Terramycin Troches.

Dr. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

See page 8

D.D.1

THE COLUMBUS DENTAL MFG. CO.  
 COLUMBUS 6, OHIO

Please send information on Steele's  
 Flatback New Hue Facings and Gol-Fac  
 Backings.

Dr. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

See page 37

D.D.1

THE W. V-B AMES CO.  
 FREMONT, OHIO

Please send information concerning  
 Ames Cements.

Dr. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_